



#### TUTORIAL OVERLOAD!

Welcome to the 47th issue of 3DCreative - a magazine that we should probably rename "3DTutorials", as we have some great plans for tutorials for the upcoming issues! We kick things off this month with not one, but two brand new tutorial series for you alongside the second in our new Manimal Character Creation Series.

So what's new? Well, our biggest new project to get your teeth

stuck into is our NEXT GEN CHARACTER CREATION SERIES, in which we have some great talents in the forms of Joseph Harford,

James Busby, Gavin Goulden and John Hayes writing for you a six-part series on how to create a next gen character in 3ds Max (Joe), LightWave (James), Maya (Gavin) and last but not least, modo (John) (p.83). The first chapter in the series is all about the low-res base mesh, which our artists knock up using ZSpheres in ZBrush and then proceed into the various software packages to clean it up in preparation for part two of the series: the high-res sculpt! We're looking forward to seeing how this tutorial goes down over the next six months – we've already seen the final results and it really is worth signing yourself up for a subscription to make sure you don't miss out and get each instalment when it's hot off the electronic press!

Our second new series for you all is – and no, we're not crazy – a Photoshop tutorial series! Photoshop, I hear you ask?! Well, we can't deny that Photoshop is a valuable tool in 3D when it comes to postproduction of your renders, and the results we've witnessed over the years from artists who utilise Photoshop to give their renders that extra bite have helped confirm that what we're missing in 3DCreative is a series on PHOTOSHOP FOR 3D. So here we go: part one of our new series looks as how the most common render passes can be used in Photoshop, and we have non-other that post-production pro Zoltan Korcsok back to teach us all he knows (p.40). Stay tuned for part two next month when Richard Tilbury will be taking us through retouching your final renders - another great reason to stay with 3DCreative!

Jesse Sandifer is back with us again this month to talk us through how to create a Mammal-Man in ZBrush, in the second instalment of our MANIMAL CHARACTER CREATION SERIES. Jesse has gone for a surprised deer-type creature crossed with a guy, with great emotion and expression, and he also teaches us a neat trick of how to paint our textures in ZBrush to achieve some pretty cool results (p.50).

In this month's interviews we catch up with two artists that we've got to know through the creation of our recent book project, Digital Art Masters: Volume 4 – we thought it'd be great opportunity to learn more about them and show off their stunning portfolios in all their glory! Our first interview is with CG all-rounder, Weive Yin, who never fails to impress us with his latest works – be they of the 2D or 3D genre. Weiye has a fantastically diverse portfolio that is well worth checking out on p.6. Second up we catch up with senior artist, Tomáš Král, who rather

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LAYOUT CONTENT

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Tom Greenway

Richard Tilbury

Chris Perrins

Layla Khani Matt Lewis

LEAD **DESIGNER** MARKETING

Chris Perrins Jo Hargreaves

#### FREE STUFF!

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Lynette Clee

Wherever you see this symbol, click it to download resources, extras and even movies!



Proofing

Lynette Clee

Jo Hargreaves

modestly only sent in just a few of his stunning 3D renders for this interview. We knew he had more to show off than that, so check out p.16 for a visual treat as you step into the mysterious mind of this talented 3D artist.

To wrap this issue up we have two great making of articles by Andrew Averkin (p.60) and George Krallis (p.72). We've also had a play and got our first moving image featured in Andrew's making of feature, so prepare to be hypnotised by the seduction of things in motion! Last but not least, we've got our usual great selection of 3D images in the Gallery section - this month we feature the latest work from Michal Kwolek and Rudolf Herczog to name just two. So enjoy July's offerings, we'll be back with more next month! ED.



#### SETTING UP YOUR PDF READER

For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: DOWNLOAD!

To view the many double-page spreads featured in 3DCreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

- 1. Open the magazine in Reader;
- 2. Go to the VIEW menu, then PAGE DISPLAY;
- 3. Select TWO-UP CONTINUOUS, making sure that SHOW COVER PAGE is also selected.

That's it!

# Get the most out of your Magazine!

If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!







### Contributing artists

Every month many artists from around the world contribute to 3DCreative magazine. Here you can read all about them. If you would like to be a part of 3DCreative or 2DArtist magazines, please contact: lynette@3dtotal.com

This new tutorial series provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. Joseph Harford, Gavin Goulden, James Busby and John Hayes tackle this new series providing versions for 3ds Max, LightWave, Maya, and modo.



# JOSEPH Harford

An avid artist since childhood. After freelancing in advertising and film, he worked in the games industry at



Crytek GMBH, the German games company behind Far Cry and Crysis. He later moved to Ubisoft as a senior character artist, and now works as a freelance artist while running ShineFX, a digital asset company.

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## James Busby

After working in the industry for about seven years on everything from games to television ads, James setup his

own Sheffield based company, Ten24.info, in 2008, which provides assets for all sectors of the media. He hopes his version of the next gen tutorial series will be useful to those wanting to pick up LightWave as a character modelling tool. http://www.ten24.info

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# John Hayes

Coming from a 2D background, John started in game development in 1996 as a concept artist and character artist. The



first few Nintendo games improved his 3D digital skills and techniques for game development. He then joined Capcom as a senior character artist, moving into character lead, followed by his role at Sega as senior character artist and then character art lead. http://zugok.cgsociety.org/ zugok@sbcglobal.net



# Jesse Sandifer

A self-taught digital artist with 8 years experience. He coowns Green Grass Studios in Dallas, Texas, which works on

a variety of projects for films, games, television, commercials and in-game arena entertainment. Most of his spare time is spent participating in online challenges, doing personal artwork and dabbling with drawing and traditional sculpting.

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# Zoltan Korcsok

Graduated from the Moholy-Nagy University of Art and Design as a designer in visual communication arts



(MA). He's currently a freelance 3D artist, illustrator and book designer, who's been working in the games industry since the 90s. He's a modo beta tester with experience using a variety of 3D software: ZBrush, Cinema 4D, Maya and Silo. http://www.zkorcsok.hu trurl10@gmail.com

#### Contributors





#### Weiye Yin

A CG artist who has been engaged in the art of game research and development for many years, and is skilled in all areas of

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production from concept design and illustration, to 3D modelling, texturing and lighting.





#### GEORGE Krallis

A graphic designer from Xanthi, Greece; he has an advertising office and spends most of his time designing graphics for



companies. His interest in 3D started six years ago when he encountered 3ds Max, after which point he started to work with other 3D software, such as Vue, Poser and ZBrush.

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# WEYE YN

Hi Weiye - now it's not every day you see an accomplished 2D and 3D artist, so it's a real pleasure to talk to you today. Right let the probing begin! Could you introduce yourself and tell us how you got into 2D and 3D?

Before I started doing CG, I was a canvas painter. In 1997 I began to dabble in the art of CG production and achieved some good results. In 2003, I engaged in an official CG art work.

So what made you take the leap from traditional canvas to a digital one?

The practical reason was that it is easier to make a living from CG art. Of course, I do love CG art a lot. Compared to traditional art, CG art - in particular, 3D art - is a lot more versatile. You can create more realistic fantasy lands, and it has removed all of the constraints of 2D space, giving you more dimensions to play with. It's basically a completely new mode of art.

So how did you get into art? Can you recollect the first image you ever painted?

When I was a child, I was very interested in painting, and often doodled around. My parents discovered my interest, so they sent me to a painting training class. Since then I have met



many good teachers and spent over twenty years cultivating my interest in art and gaining professional training, which has allowed my entrance into artistic circles.

"I ATTACH GREAT IMPORTANCE TO THE FINAL EFFECT, NO MATTER IF ITS 3D OR 2D WORK. EVERY PICTURE IN A REAL-TIME RENDERED GAME SHOULD BE AS BEAUTIFUL AS A PAINTING ..."

Well, my first image would have been a work from my childhood. It was quite simple and I've almost forgotten it! What I still remember very clearly is an oil painting teacher of that I met when I was nine years old. He was the one who truly brought me into the realm of traditional art.



#### WEIYE YIN Interview

Browsing your portfolio I can see that you have a huge variety of work, from stunning portraits to wondrous landscapes and even to some low poly game pieces. So what does a talented artist such as yourself do for work?

From 2003, I became engaged in research and development art for games. The control of each stage of the development, from concept design, 3D modelling and texturing, through to atmosphere control of light and shadow effects, is not only my job, but it's also my hobby.

"EVERY PICTURE IN A REAL-TIME RENDERED GAME SHOULD BE AS BEAUTIFUL AS A PAINTING, BECAUSE CG SHOULD BRING AS MUCH SENSORY EXPERIENCE TO THE VIEWERS AS TRADITIONAL PAINTING."

The one thing that strikes me most about your work is the richness of the colours you've used, making me think that you take great pride in the texturing side of your work. Could you tell us how long you typically spend in this particular area of the creation process?

I attach great importance to the final effect, no matter if its 3D or 2D work. Every picture in a real-time rendered game should be as beautiful





as a painting, because CG should bring as much sensory experience to the viewers as traditional painting. Rich colour is represented in the whole picture, while every texture is an important factor within the piece as a whole. It does not cost me much time to represent the details, but harmonizing the factors is very important and can be pretty time-consuming.

What has been your most accomplished piece of artwork to date, and why?

Many people have asked me this question and

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my answer is always the same: the best work of mine will be the next. Although this answer seems to be empty, it is a serious answer because I'm always trying my best to exceed myself.

Ahh, good answer! Okay let's try and reword it. If you had to pick one piece for self promotion purposes (whether it be for the first image you place on your website or in a gallery), which piece would you choose and why?

In aspect of techniques, I will choose the 3D

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character "Red Girl" and the 3D scene "Tower" because I devoted a lot of time to these two works. If I have to choose one from these two, then it would be "Tower" because it reflects some of my feelings.

As I mentioned previously you're an accomplished 2D and 3D artist, but which area to you favour the most, and why?

Because I used to be a canvas painter, I slightly prefer 2D. Having said that, in my opinion, 2D and 3D are just different parts of the same





whole. They both show visual art and so 2D and 3D are complementary and indispensable in the creation of my work.

A lot of 2D artists nowadays use 3D in order to help achieve correct perspective or to

experiment with different viewpoints. Have you been tempted to mix these two mediums together to help in your production of art?

I'll mix these two mediums if the perspective is very difficult, but it is very rare because camera perspective in 3D software is very different from

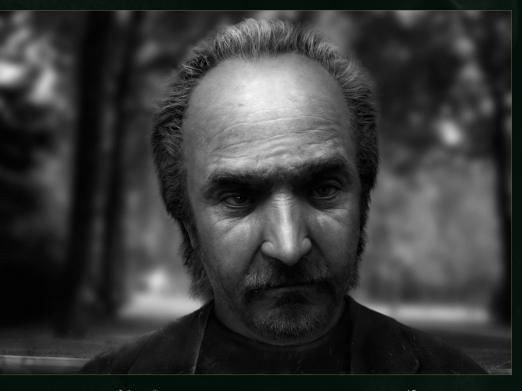
what we see with our eyes. Relying on 3D to achieve correct perspective tends to make my work quite stiff.

Putting aside work for a moment, what kind of things do you do to unwind when you have a spare moment?

Besides painting, I love to go out sight seeing, to seek inspiration in the wide world and relax my body and heart.

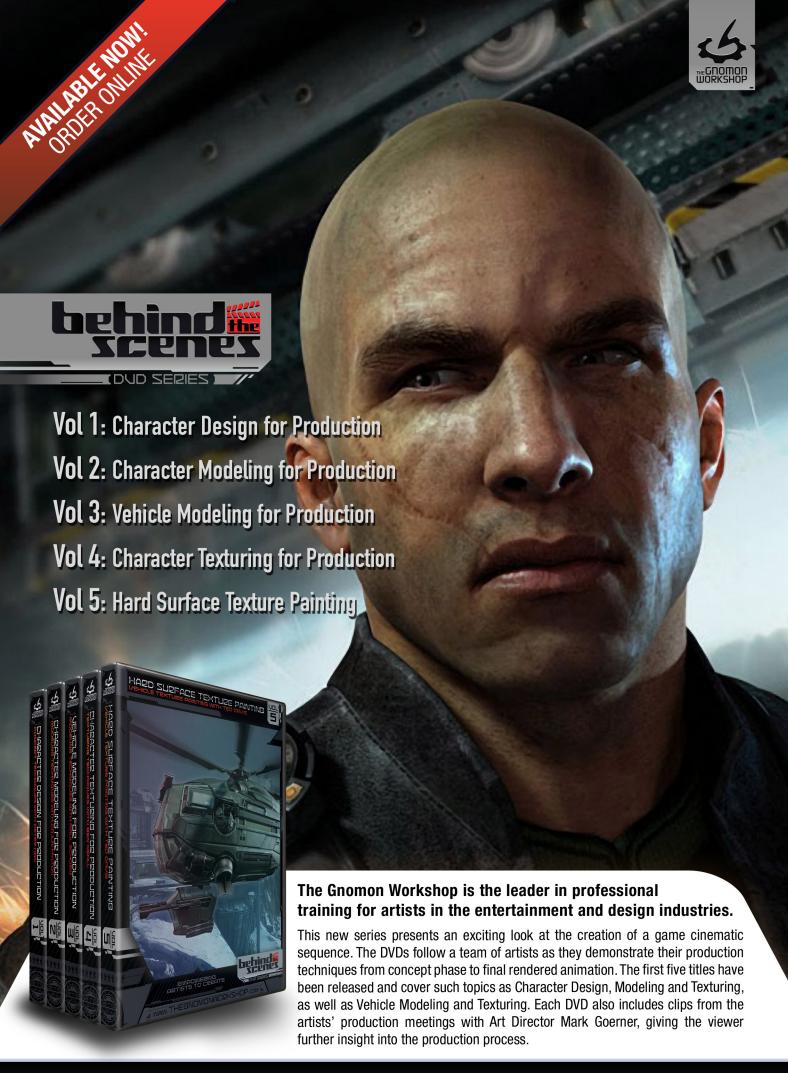
Well it has been a pleasure chatting with you Weiye and I wish you all the best for the future. One last question before we wrap things up: With switching from traditional to digital, have you been tempted to switch back?

I've never given up or stopped traditional painting. I always paint when I'm free. Because I think traditional oil painting is not only my base, but also my capital, which I won't throw away. We live in a fast-pace society now, and to make a living, traditional art has to be laid aside as a hobby. I just hope that someday it will become an important part in my life again.



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# tomas krai

You currently work for UPP, a visual effects and post production studio in the Czech Republic.
Can you tell us a little about your role there?
Yes, that's true. I work there as a Senior
CG artist which covers things like modelling, texturing, lighting etc.

#### "THE CLEAN 3D RENDER IS ONLY HALF OF THE JOB, THE POST PROCESSING IS AS IMPORTANT AS A GOOD QUALITY RENDER"

You see, most of the 3D artists in UPP are generalists, which means that you have to deal with most types of the production; there are only a few people specialized in one area of work. So it really depends on the actual request. But most of my work includes the lighting and tweaking of the renders. That's why I find it important to know at least one compositing package and try to be as independent as you can.





It seems as though there are an increasing number of artists using post production more and more now, even when creating stills. How do you regard this process in comparison to pure 3D?

Personally, I like to use all the available methods that can help me to achieve the best possible final artwork. In fact the clean

3D render is only half of the job; the post processing is as important as a good quality render and it can save a lot of time. I can add contrast and exposure tweaks to my creations very quickly, and in real-time nice colours. I use post processing a lot even on my personal stills, because I find the process of tweaking the shapes, colours and stuff like that, very creative.





I love to use a set of various dirty textures which I usually blend in Photoshop and combine with my render.

#### "MOSTLY I CARE ABOUT THE STORY OR THOUGHT THAT I PUT INTO THE IMAGE TO MAKE IT COME TO LIFE"

There are a number of images on your website relating to the *Ashfall* game. Can you explain the idea behind the project and what it involved on your part?

The idea of making the game came to us some time ago. We later named the project *Ashfall* purely for our own satisfaction. We started putting together various ideas, thoughts and, of course, numerous graphical concepts. Our two game designers then did their best to build something from that crazy mess [Laughs]. This game was always meant to be a mix between adventure and RPG style of playing, with a very strong story line. There were supposed to be fully 3D characters moving freely in pre-rendered environments. And these environments were my part of the work.



Unfortunately we never found a publisher or investor, so this project will sadly end as an unfinished dream.

Your portfolio covers both environments and characters, but what particular subjects interest you the most and why?

You know, I don't really separate it like this. I just enjoy working on my artworks and I don't

care if it is an environment, character or maybe even a cartoon. Mostly I care about the story or thought that I put into the image to make it come to life, or some feeling that the image is supposed to convey to the viewer. I've never considered myself as a great artist. I think my pictures are rather decorative or illustrative. But in any case I try to put more into my creations than just pretty colours. I think that the



viewers will know when there's something more in the picture than meets the eye, when the pictures are made peculiar and with passion.

What areas of CG do you feel you have made the most advances in during your career so far? That's a tricky question. I guess drinking gallons of coffee? [Laughs]. No, really, I think I've got much better at one thing for sure: I used to be incredibly careless and any kind of a reasonable scene management was way below zero level.

Now, when working at UPP, it's expected that my work is not only of a high quality, but also

neat so that others can work with my scenes. I've come to realized that using correct naming conventions and other things is an absolute necessity; otherwise the mess will eat you alive! Other than that, with programs such as ZBrush, not only has the quality side of modelling gone significantly up, but also the speed and efficiency. I'm able to model exactly what I want nowadays. The rest is just all about practice.

Which piece from your gallery do you feel conveys the most interesting story in your opinion and why?

I don't know; it's very hard to say. Every one of



my artworks means a different thing for me. In the majority of cases it's an expression of some sort of mood. For example, when I was creating "Marv" I was feeling angry about something and I think that this mood soaked through to the image. But the most valuable artwork for me is the "It likes candy" picture. This artwork was created as a series of three pictures with a "toys" theme. I wanted to create the perception that even in an innocent childhood environment there are things which, when looked at from a different angle, can be perceived as horrifying. That's why I took a traditional Russian Matrioshka toy and came up with a little chickenlike creature that lives inside it. I didn't want it to appear too frightening, so I adjusted the theme to the cuteness of toys.

Do you do much of your texturing in ZBrush or is it primarily in Photoshop?

And the winner is, Photoshop! I have to say that Photoshop techniques are more suitable for me. As for the textures, I use ZBrush only for generating some displacement, normal and cavity maps and then blending them in Photoshop with my painted texture. ZBrush has another great function, which is the possibility of using Zapplink to export any matcap that you want and enabling you to use it as a background









for your texture. I often use Cinema BodyPaint, because of the ability to paint on the actual 3D model. I know that you can do a similar thing in ZBrush but at this point in time BodyPaint is really well connected with Photoshop and when combined, these two programs give me the results that I want.

Tell us about *Charge the Dragon* and the impetus behind it?

I was given a chance to work on a beautiful project called *Charge the Dragon*. It is a short animated film directed by a great animator, Jan Bubenicek and divided into three short, funny, sketches about a bold knight who's determined to bring down a dragon. This project is primarily about characters and so I'm taking care over the rendering, texturing and the general look of the characters. It's a beautiful job.

The project sounds very interesting for sure. Did you have much input with regard to the design and where will people eventually be able to see it?

The essence of this short movie is some sort of test, to see if we are able to transfer the freedom and the simplicity of pencilling to the 3D space. So in that sense we are trying to keep the designs as simple as possible in the shapes, but at the same time they have to realistically describe each other.

The background in the movie will be completely 2D, so in the end it will be some sort of mix between 2D and 3D animation and render.

When it will be finished you will surely see it on our website and we certainly want to try to send it to several festivals. But the idea really is to put it on our site and eventually lengthen it out for some more short stories. So this short movie we are working on right now can be considered a sort of a "pilot" and if it is successful, we will try to make more funny shorts.

What aspects of the CG pipeline do you find the most interesting?

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Mapping! No, that was a joke [Laughs]. As I mentioned, my work is very miscellaneous and ranges from modelling to even making some matte paintings, but what I really enjoy the most is lighting the scenes. When all your models and textures are done and you just bring your hard work to life by adding some beautiful, atmospheric light. I don't really seek any sort of realism in my personal work, I just tweak the lights long enough to make it look exactly the way I want. But as for my commercial work, on some particular shots of course it has to be hyper-real otherwise it would lead to a bad visual effect. The best visual effect is that which you really can't recognize as an effect.

What techniques do you find most effective when lighting your scenes and which renderer do you favour?

For the rendering of my personal stuff I use a third party render called finalRender, for several reasons. First of all, I understand it quite well; secondly it is a fair trade between quality and render times. I like to use Global Illumination in combination with my manual lighting and finalRender has, at least currently, the fastest GI on the market.



our pipeline. Of course, in the VFX industry, time is one of the most valuable things so the renders have to be done very quickly.

For my work, at UPP, we are using mental ray in







Sometimes when I work on a very complex scene, I don't even use the final gather or GI, but only manual lights in combination with some HDR images.

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# 

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Issue 047 July 2009









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Check back in with us next month here in 3DCreative magazine for an interview with Christophe Desse!







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# NEXT GEN

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

#### FOLLOW

The exciting first chapter of our new tutorial series is divided into two categories, the first of which focuses on using ZBrush to create a low-poly sculpt from ZSpheres to approximate the proportions of the creature concept. The second section takes and imports this mesh into the appropriate software and explains the principles and importance of optimisation.

So if your interested in seeing the results and want to follow along with our new set of artist please flip to the back of this magazine and enjoy.

3DSMAX | PAGE 083 LIGHTWAVE | PAGE 109 Maya | Page 129 MODO | PAGE 149













#### **CHAPTER 1: RENDER PASSES**

Here we concentrate on the ways in which the most common render passes can be combined in Photoshop to produce a final image. The chapter looks at the blending modes appropriate to each and the manner in which they can be manipulated to the best effect. Specular, Reflection, Ambient Occlusion and Diffuse passes are covered, as well as the way in which to apply ZDepth through the Lens Blur filter.

CHAPTER 2
Blending & Cloning

CHAPTER 3

Lighting & Special Effects

CHAPTER 4

Curves, Levels, Colour Balance & Layer Styles

CHAPTER 5

Layer Masks & Adjustment Layers

CHAPTER 6

Creating Backgrounds

# entoshop for 3D

This series of tutorials aims to show the value of post-production and more specifically the ways in which Photoshop can be used to aid the 3D pipeline. Over the course of six chapters we shall focus on the various tools and techniques on offer in Photoshop that are frequently used to improve 3D renders. Compositing passes, adding particle effects, improving lighting and making general colour adjustments are a few of the topics covered, as well as ways to create backgrounds that both complement and enhance characters. The methods presented within this series can provide an efficient alternative to lengthy render tests and experimenting with numerous settings, and will enable artists to seamlessly blend 2D techniques into a 3D process, resulting in a versatile and streamlined workflow.

## Photoshop for 3D

#### PART 1: RENDER PASSES

Created In: Photoshop

#### INTRODUCTION

This article showcases the tools and settings typically needed for the compositing of render passes in Adobe Photoshop. Rendering images into passes from rendering software makes it possible to modify tone, colour and certain effects in the rendered image, without the need for rendering it again.

#### PREPARE YOUR LAYERS

To follow this tutorial, we need to have the following render passes at hand:

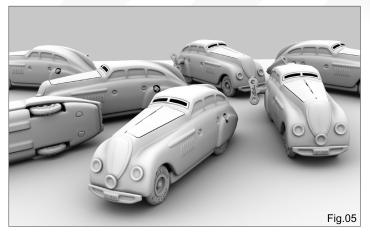
- Final Color Pass We'll use this pass as a reference for setting up the layer structure.
   It contains all the final effects, direct and indirect lighting, shadows, specular and reflection effects (Fig.01)
- Diffuse (Total) Shading Pass This contains the colours of the materials in the scene, and the shadows (Fig.02)
- Specular Shading Pass This contains the specular effects of the materials in the scene caused by the lighting (Fig.03)
- Reflection Shading Pass This contains the reflection effects of the materials in the scene (Fig.04

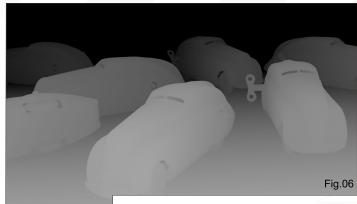












- Ambient Occlusion Pass This contains the ambient occlusion effect; it gives shading to the areas hidden to the ambient light and it shades the more obscure parts of the models in the scene. Using this pass gives more depth to the details (Fig.05)
- Depth Pass This contains the depth map of the scene measured from the camera. We use this pass in Photoshop to create a lens depth of field effect, amongst other things (Fig.06)

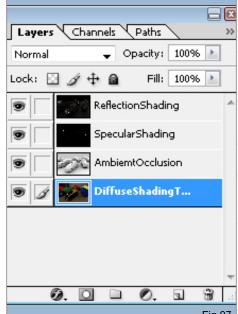
Other available passes can be utilised to achieve more delicate effects (e.g. Fog pass,

Global Illumination pass, Specular Colour pass, and so on).

## STEP 1 – CREATING THE LAYER STRUCTURE

Create the base layer structure using the following order and blending modes (Fig.07):

- Diffuse (Total) Shading Pass blending mode: Normal
- Ambient Occlusion Pass blending mode: Multiply
- Specular Shading Pass blending mode:
   Screen or Linear Dodge









• Reflection Shading Pass – blending mode: Screen or Linear Dodge

Here are the passes combined after putting the above layers together (Fig.08).

#### STEP 2 – FINE-TUNING

Comparing the Final Color Output with the image put together using the passes reveals that the ambient occlusion effect is too strong

(Fig.09). The simplest way of correcting this is by setting the opacity of the Ambient Occlusion pass layer to 30%. The strength of any render pass is easily adjustable by changing the opacity. The Ambient Occlusion pass can be used for brightening the midtones by duplicating it, and changing its blending mode to Soft Light or Overlay. The strength of this effect can also be adjusted by modifying the opacity.





Here we can see the composited image with and without the Ambient Occlusion layer with Overlay blending (Fig.10 – 11).

To change the Opacity or Fill value of a layer: select the layer in the Layers palette, set the value using the Opacity and Fill text boxes, or by dragging the slider. Another method is to go to Layer (main menu) > Layer Style > Blending Options, enter a value in the Opacity text box or drag the slider under the General Blending section, and adjust Fill Opacity under the Advanced Blending section. This does not apply to the background layer; it doesn't have such values.



Here we have the settings for the Opacity of the layer in the Layers palette (**Fig.12**), and the setting of the layer's Opacity in the Blending Options menu (**Fig.13**).

### STEP 3 – ADJUSTING THE COLOUR

The image put together from the passes looks a bit pale compared to the Final Color pass (Fig.14). We can make the colours more vivid using a Hue/Saturation adjustment layer, and setting the Saturation to +15. To create a Hue/Saturation adjustment layer, go to the Layers palette, click on the Create new fill and adjustment layer icon, and select Hue/Saturation. Alternatively, go to Layers (main menu) > New Adjustment Layer > Hue/Saturation. And here we have the settings for the Hue/Saturation adjustment layer (Fig.15).

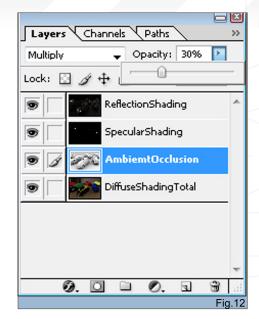
We'll give a bit more contrast to the image now using a Brightness/Contrast adjustment layer. Set the value of brightness and contrast to +5. To create a Brightness/Contrast adjustment layer, go to the Layers palette, click on the

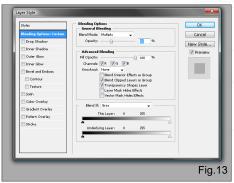
Create new fill and adjustment layer icon, and select Brightness/Contrast. Alternatively, you can of course select Layers > New Adjustment Layer > Brightness/Contrast. Here are the settings for our Brightness/Contrast adjustment layer (Fig.16).

## STEP 4 – USING THE DEPTH PASS TO MAKE A DEPTH OF FIELD (LENS BLUR) EFFECT

Amongst other things, we can use the Depth pass in Photoshop to achieve a depth of field effect. It can be done using the Depth pass as a mask. First of all, merge all the passes into one layer (Layer > Merge Visible, or Shift + Ctrl + E), and then create a mask for it (Layers palette > click on the Add layer mask icon, or alternatively go to Layers > Layer Mask > Reveal all). Turn on and select the Layer Mask on the Channels palette, and paste the Depth pass into it.

The blur effect can be achieved using the Photoshop Lens Blur filter (Filter > Blur > Lens Blur) (Fig.17). The dialogue for the Lens Blur filter contains a preview window where you



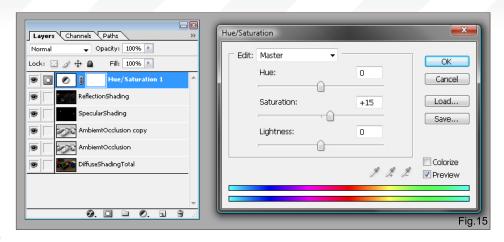




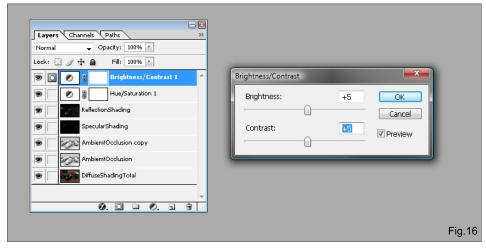
#### PHOTOSHOP FOR 3D Part 1: Render Passes

can see it with the current settings, alongside the settings panel. The Preview section can be found on this panel, where it can be turned on and off, or switched to Faster or More Accurate. Select the Layer Mask (with the Depth map) from the Source scroll-down menu of the Depth Map section; the filter will generate the Lens Blur based on this map. The focal distance can be adjusted either by using the Blur Focal Distance slider or by clicking the part of the preview image we want to focus on. The iris' shape can be adjusted under the Iris section; we use Square shape with an Iris Radius value of 25, and Blade Curvature and Rotation both set to the value of 0.

The Brightness and Threshold of the specular highlights of the image can be adjusted under the Specular Highlights section. In this case we set Brightness and Threshold to 0. The noise of the blur effect can be set up under the Noise in the Specular Highlights section; we leave these at their default 0 values for this task. After applying the effect, delete the mask.



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In this example, the composition of the image was suitable for a depth of field effect, but this is not always the case. You can see the final composited image here (Fig.18).

#### Tips for Handling Layers

- Another way of setting the layer opacity is to select the layer, select the Move tool, and then type in the number you want the percentage of its opacity to be
- The mask of a masked layer can be easily switched on and off, just left-click on the mask while holding down the Shift key

- Putting the layers into sets makes them
  easy to duplicate, so you can always leave
  a backup copy of the arranged layers in the
  file. This can be useful if you merge a set
  copy for lens effects
- A layer or layer set can be easily duplicated by grabbing it on the Layers palette and dragging it down onto the Create new layer icon at the bottom of the palette
- A new layer set can be created by clicking the Create new set icon which can be found on the bottom of the palette. You can then simply drag the layers into it. Another option

is linking the layers belonging in one set with the currently selected layer to it, and then selecting New Set From Linked on the Layers palette

#### ZOLTAN KORCSOK

For more from this artist visit: http://trurl.cgsociety.org/ or contact: zoltankorcsok@gmail.com





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"...WHEN I STARTED June 2009 Part 1: Bird-Man THINKING ABOUT WHICH **JULY 2009** KIND OF MAMMAL TO BASE Part 2: Mammal-Man IT FROM, I WAS REALLY August 2009 TORN. I MEAN ALL I HAVE Part 3: Aquatic-Man TO DO IS CREATE A HUMAN September 2009 Part 4: Amphibian-Man **BODY AND STICK ON SOME** RANDOM MAMMAL'S HEAD OCTOBER 2009 Part 5: Insect-Man AND CALL IT A DAY, RIGHT? NOVEMBER 2009 Wrong!" Part 6: Reptilian-Man Download your free base mesh here! creation series: part 2 - mammal-man Welcome to the new ZBrush Manimal Creation tutorial series. Each month we'll see a new artist tackle one of our topics, who will take us step-by-step through the transformation of a generic human head and torso base mesh into a hideous amalgamation of man/creature of 3DCreative's choice! We thought that topics such as a bird, aquatic, and insect would be fantastic for detailed sculpting work - and on top of all this, the artists will texture their models, too, bringing these monstrosities to life. So stay-tuned over the next six months to see what they come up with, and to learn a thing or two about detailed sculpting and texturing in ZBrush. The second part of this tutorial series will see Jesse Sandifer cover the development of a Mammal-Man. Enjoy!

# Manification series

#### PART 2: MAMMAL-MAN

Created In: ZBrush

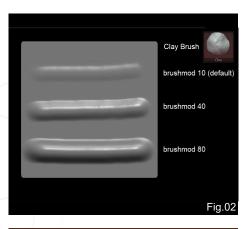
#### INTRODUCTION

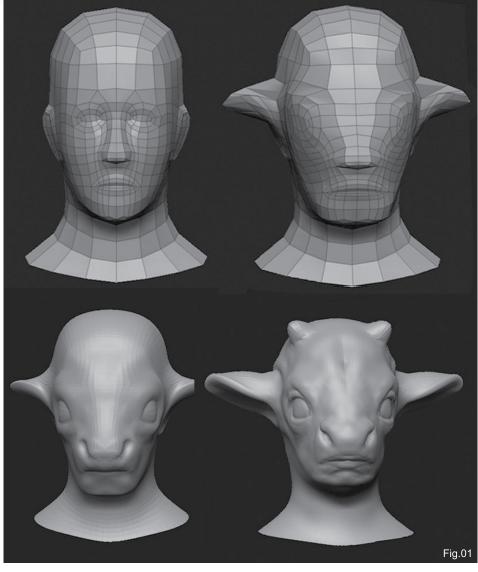
When I was asked to create something for this Manimal series of tutorials, I snatched up the Mammal-Man option and thought I had a really nice opportunity to design and create something really cool. But when I started thinking about which kind of mammal to base it from, I was really torn. I mean all I have to do is create a human body and stick on some random mammal's head and call it a day, right? Wrong! I have to think about the expression, the pose. the character itself ... There has to be a reason why I choose with a certain kind. So I decided the best bet would be to create something that isn't anything specific at all, and so I'm going with the idea of doing a hybrid. Deer and cows came to mind as my foundation because I know that they get spooked, or get "caught in the headlights" which may lend to a fun pose of being spooked and recoiling!

#### **SCULPTING**

Starting off, I do my usual setup of Polygroups.

To do this, press Shift + Ctrl, and click and drag to isolate the polys you want included in a group (i.e. the head and neck). To hide any polys directly, you can Shift + Ctrl-click and drag, and then let go of Shift. It sounds complicated





but once your fingers remember the pattern, it's really simple. You're basically toggling that Shift key after you click and drag. Once you have the intended polys isolated, you can group them by going down to the Tools > Polygroups rollout and click on Group Visible. Auto Groups will group your model by separate elements so that's handy too. So after this I continue on by blocking out major forms of muscle groups. I need to establish the design of the head of the character early on. I pull out the ears, enlarge the eyes, and draw the snout out in order to make it look a bit more like a deer type animal (Fig.01).

I thought it'd be fun to give him some hooves on his hands, but only to replace a couple of his fingers. I don't want to get too literal or realistic with it, though. At this stage I'm just using Move, Clay, Clay Tubes, and occasionally Inflat brushes. The Move brush is good for literally transforming polys around based on the brush size and Focal Shift. I like to turn up my Focal Shift to get a higher falloff. It's great for getting your low-poly base mesh in the right forms early on. The Clay brush is a good brush for slowly building up forms, which is what I do in the first 2-3 levels of subdivision before moving to fancier details or wrinkles/folds. It's nice because it has a nice built in falloff that's real soft on the edges, but flat in the centre. Clay Tubes brush is similar to Clay, but it's a bit more rough and excellent for setting up muscle flow. I like to change the alpha to a circular one with a tight falloff and turn up the Focal Shift a bit so it's not so harsh. For both Clay and Clay Tubes

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#### Part 2: Mammal-Man MANIMAL ZBRUSH CREATION SERIES

brushes, I change the BrushMod. This basically increases the effect of the brush so you can lay in forms guicker. I usually only raise up to 30-40, but I've gone a little higher in the example so you can see the difference (Fig.02). I dock the main button to my interface so that I don't have to dig for it - it's in the Brush menu next to Mesh Insert. And to drag the button somewhere, just go to the Preferences menu, click on Customize UI, and then click Enable Customize. Then you can Ctrl-click and drag buttons anywhere on the interface from menus or wherever else. Also. keep in mind that when you work in ZBrush, it's commonly known to work your way up the subdivisions and nail your forms down first. Foundation is important (Fig.03).

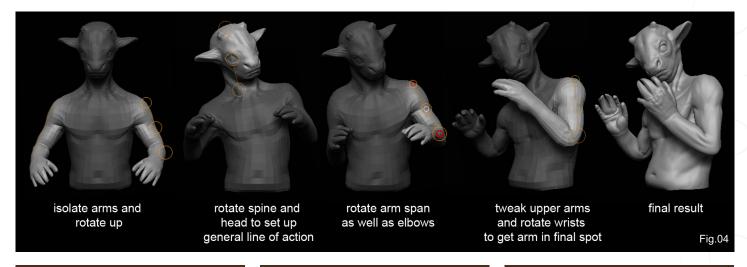
Once I get to the point where I'm happy with the model, and before detailing it with textural alphas and wrinkles, I go ahead and pose the character. To do this click on Move, Rotate, or Scale and mask off areas you don't want effected on your model. If you click and drag up on an area like an arm, the masking will follow your stroke. You can also Ctrl-click on a Polygroup and it will mask everything else. Very handy! So for the actual posing, I start off by rotating the lower arms by using Rotate and click-and-dragging the gizmo from the elbow joint to the wrist. This way you're simulating an accurate rotation. I don't use Move too much because it stretches the geometry if you click on the end circles of the gizmo. If you click on the middle circle, it'll keep the polys intact but will

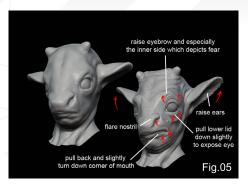


move from that position. So it is actually good for tweaking the position of the arm after doing the rotation. I then rotate the spine, head, and upper arms in the same way. At this point I'm nailing down the general action line to try and get a nice silhouette as well as strengthen the expression on the character's face. Then it's about tweaking the arm rotation and span (by span I mean how close they are to the sides of the torso). Then it's a matter of rotating the wrists, but only to the point where they can

realistically rotate. I like to get the pose at about 90% and I leave myself the freedom to change it later on if it isn't "perfect" (Fig.04).

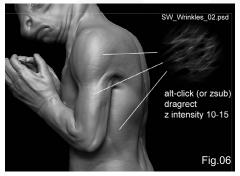
I fiddle with the expression on the face a bit here. I do most of this work on the face with the Move brush to keep the forms intact, and go through a lot of different emotions in the eyebrows until I find a nice "spooked" look. On one side I'm going for a wide eye showing the whites with the iris being close to being





completely exposed; the other eye squinting and wincing in anticipation. The eyebrows are pulled up with a worried feel; the mouth corners turned down; the nostrils slightly flared out from breathing in sharply. Later on, the detail I add will be to support the pose of the face: wrinkles above the eyebrow, bulging around the corner of the mouth, folds for ear connections, and so on (Fig.05).

After getting the basic look for the face sorted, I go back to sculpting the rest of the body. Since I've posed out the character, I can no longer run regular symmetry, so I have to turn on Poseable Symmetry. I'll turn it off every now and then to do some asymmetrical work in areas that need independent attention because of the pose. So I continue to define out the forms and cut in areas to express the nature of the muscles, bones, tendons and skin, now that I have a set pose. I also add some skin texture effects by using the Standard brush, DragRect, ZIntensity 10-20,

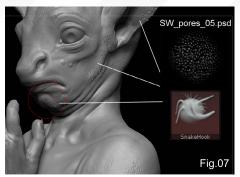


and SW\_Wrinkles\_02.psd from the Pixologic alpha library (www.pixologic.com/zbrush/downloadcenter/alpha) (Fig.06).

To do the hair, I use the SnakeHook brush with a pores alpha, a large brush size, and at full RGB intensity I methodically lay the hair effects in (Fig.07 - 08).

#### **TEXTURING**

For texturing, I do it entirely by Polypainting, with no texture maps. To set up for Polypainting, your model needs to be at the highest subdivision because it will be assigning an RGB value for every poly – the more polys, the better the resolution of your painting. For this tutorial, I could subdivide my model one more time, but this would put me at 5 million polys and my laptop gets a little shaky at this kind of poly count. So for the sake of my sanity doing this tutorial, I'm working with the 1.25 million poly model and painting that.



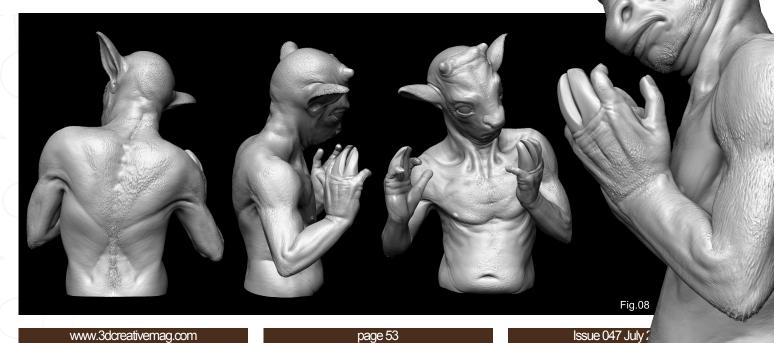
To start with, I go to the Tool menu and open the Texture rollout. I turn on Colorize. Now I can paint on my colours using any of the sculpting brushes. When you're doing this, just be sure to turn off ZAdd; it's also usually a good idea to work at a low RGB level, but that'll depend on what you're doing. I like to tear off the Color menu and dock it to the right so I can pick colours easily as I go. You can either select colour by dragging into the colour picker area, clicking on the modifiers tab and having a lot of different kinds of swatches, or by clicking on the main colour square and dragging anywhere on the screen to pick a colour. Also remember that you can use the Shift key to

The first thing
I want to paint

Polypainting

(Fig.09).

blend and blur your

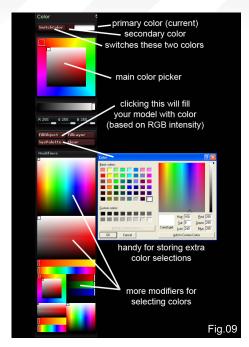


#### Part 2: Mammal-Man MANIMAL ZBRUSH CREATION SERIES

is the eyes. I know I want a big iris, but I need to keep enough white area to get across the expression of fear. So I paint the iris in a really dark brown, almost black, and paint the white areas a pale yellow, since they aren't really white in real life. I add some reddish tones in the corners of the eyeballs and apply some veins with a very small brush size. If I mess up an area and want to erase it, I just click on the main colour square and drag onto a nearby colour, and then repaint the colour back over the error in a few strokes to blend it away (Fig.10).

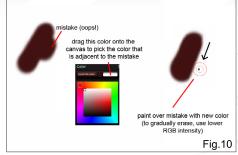
For the body, I'm taking an approach that I've learned from the great Scott Spencer, more specifically from one of his mini-tutorials on traditional airbrush painting. I'll admit that I've never airbrushed anything in real life, but the principles seem to be easy to understand once you get going. Basically, you first start by spraying colours to simulate what's going on underneath the epidermis layer.

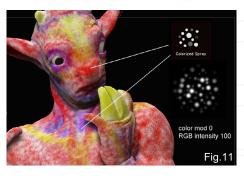
Application wise, I grab a nice red colour and use Colorized Spray with the Color Mod turned down to 0 (in the Stroke menu), an alpha mask like Alpha 07, and RGB intensity set to 100 (Fig.11). I continue by just spraying across all areas of where there are muscles or heavy blood flow, like the ears, nose, etc. I'm keeping it



really loose and liberally covering lots of area as quickly as possible. It doesn't have to be perfect, and you want to be sure not to completely saturate any areas besides the real "hot" zones.

I like to take a yellow and spray across areas where bone is really close to the surface, such as collarbones, the sternum, forehead, cranium, elbows, tendons, the bridge of the nose, etc. I also think it's handy for some fatty areas like the belly to be a bit more orange in colour. I take some purples and blues and hit the recessed areas, such as around the eyes and the jaw line/beard area. I also find it nice to blend some of



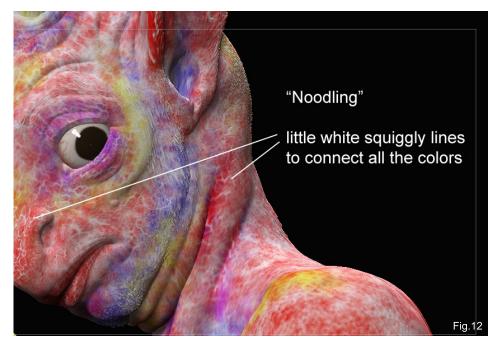


these colours a bit and make some variations on the primary colours to make some purples and oranges.

The next step is to take a white, or a slightly off-white, and start the "noodling" phase. This brings a really nice effect to the subdermal work we're doing here. So either using DragRect and Alpha 22, or by doing it freehand, noodle in with a small brush size some white squiggles everywhere. I like the effect of doing it freehand but it's a lot of area to cover so feel free to use both methods. Also be sure to keep this really loose, because it's only going to be slightly visible later on (Fig.12).

Once the noodling is done, I throw on a skin shader – I like to use MatCap\_Skin01. Then, using a Spray application with a very low RGB level between 4 and 10, and a neutral skin colour, I start to lay in colour over the subdermal work. Don't completely cover it up though. Just use the colour to blend it altogether and you'll start to see the effect it's meant to create (Fig.13).

I'll admit that this technique results in a lot of work to do all this subdermal painting only to go and cover it all up afterwards. But once you're done, try



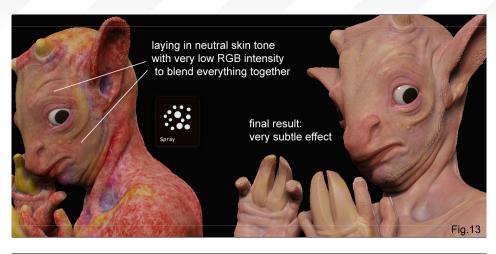
as a comparison filling the whole character with a neutral skin colour and you'll clearly see the difference! Plus, although the noodling effect is pretty subtle, it's also very powerful. It's okay to go back over some areas and enhance the intended colour by using a low RGB level again. So that's what I do in the recessed areas and around the eyes, etc. By keeping the colour level low, you're able to keep the intended effect but change the hue of certain areas. Of course, if you keep going over areas many times, you'll eventually flatten it out with that colour, so watch out for that.

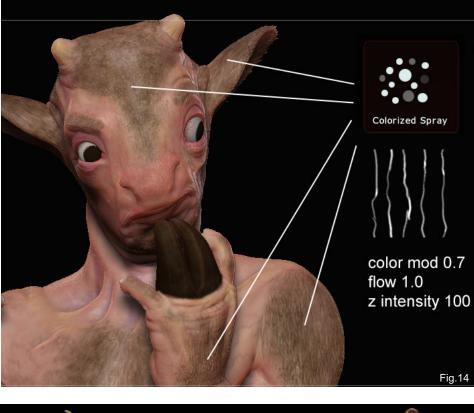
Lastly, I colour in the fingernails, hooves, nipples, veins, and dot in some freckles here and there. And for the hairy areas, I use a Standard brush, Colorized Spray, Color Mod at 0.7, and flow at 1.0 (Stroke menu) and Alpha 67. Then, with a medium brown and RGB at 100, I start to spray on the hair by stroking top to bottom (Fig.14).

The hair follows the flow of the stripes in the alpha. After applying the hair effect to all areas (don't forget the fingers), I use a light tan grey and spray some striped effects on the bridge of

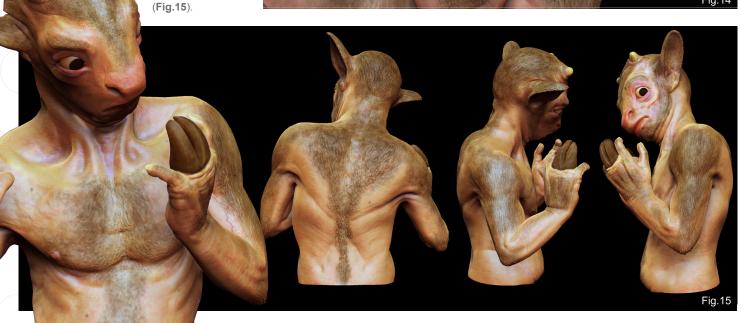
the nose, the

arms and down the back, just to break up all that brown and black





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#### Part 2: Mammal-Man MANIMAL ZBRUSH CREATION SERIES

I've also thrown together a ZBrush render composite in Photoshop to show you the final results after rendering in ZBrush (Fig.16a – 16c). It's pretty fun but not quite as powerful as a Max/Mental Ray render (Fig.17).

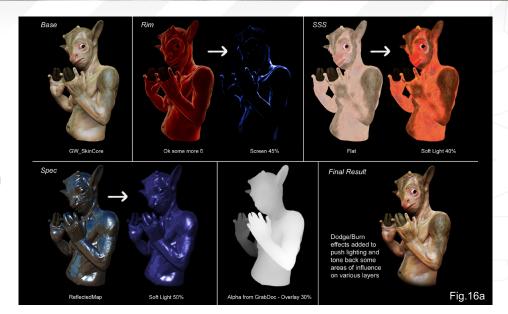
So there you have it: modelling and texturing a Mammal-Man in a nutshell! I hope the breakdown of this character creation has helped you. If you have any questions about what I've done, feel free to contact me via email.

Note from the Editor: Jesse Sandifer has kindly provided us with 8 movies to accompany this tutorial, which you can download by clicking on the Free Movies icon. Jesse is also currently considering doing some private one-on-one ZBrush tutoring to the beginner or amateur artist, so if you are interested please feel free to contact him via email for further details and information.

#### JESSE SANDIFER

For more from this artist visit http://www.jessesandifer.com or contact jessesandifer@gmail.com







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# Add Natural 3D Environments

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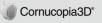






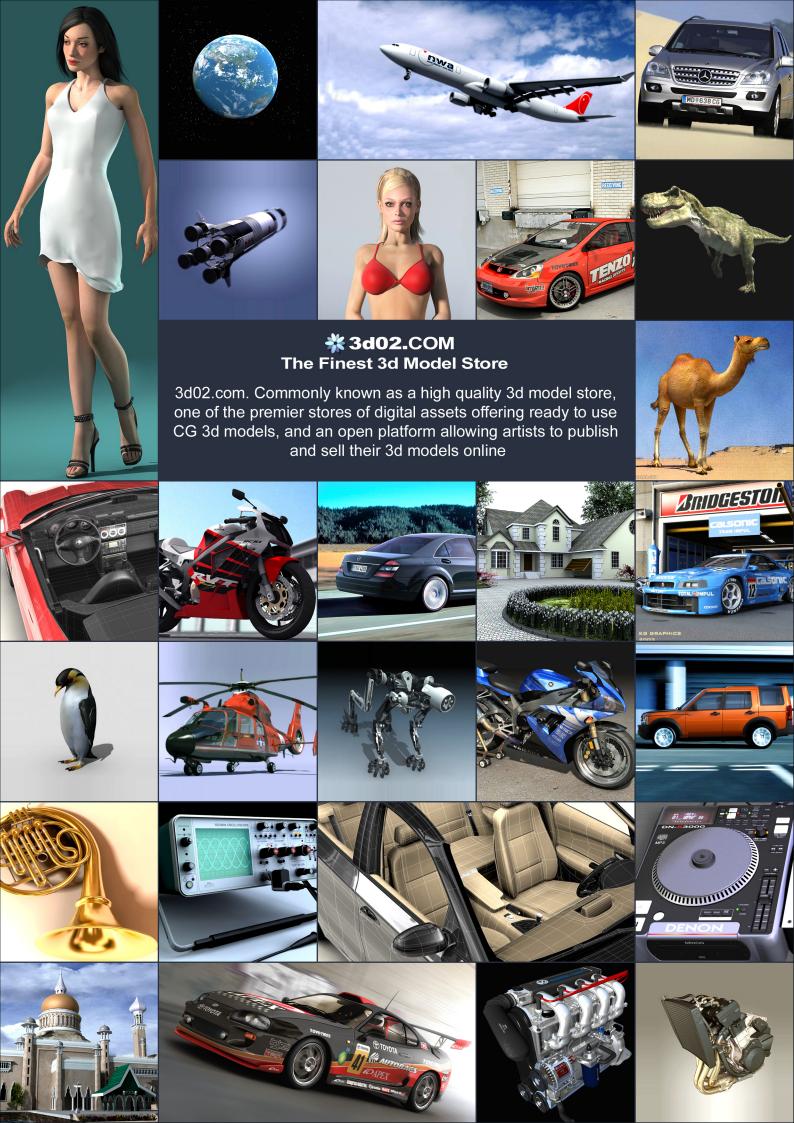














# SPIDER OF

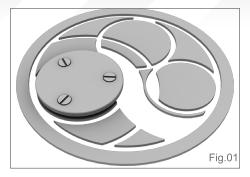
Created In:3ds Max, Photoshop

#### INTRODUCTION

Hi, my name is Andrew Averkin and this is the making of my latest image, *Spider*. By reading this, you will hopefully uncover something on your own that will help you in your own 3D art creation, so I hope you'll enjoy reading about how I created this image.

I once had an idea to create a mechanical beetle, or any other insect, and then make an animation of it. I hadn't done any animation of







mechanical devices before, let alone mechanical insects, but I thought it would be good training for me. So I began work not really thinking too much about which one insect I was going to build. During the process of design I saw that the insect looked a lot like a spider, and an imaginary picture came to me. It was at that point that I decided to continue work with the insect taking the form of a spider within an environment.

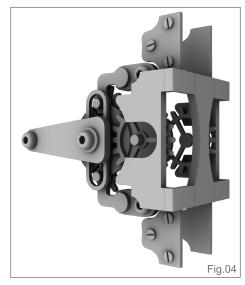


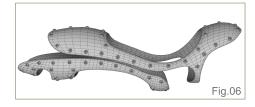
Clock details appeared in my mind. I needed pictures of spiders, different mechanical clocks, cogs, wheels, watch-maker's tools, and also images of an environment for a scene that would suit the image. I began searching for images on the internet, and after a few hours of research I collected all the necessary information I needed.

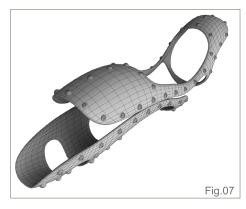
#### Modelling

I used 3ds Max to create this image. I began by taking a look at the gathered pictures and thinking about spiders in general. Spiders usually have eight legs and a body consisting of just a few parts. However, I decided to make a six-legged spider, simply because I wanted to get a more rounded form to the insect and I felt that eight legs would have been too much.









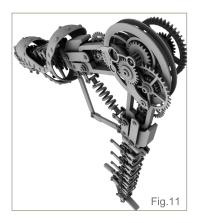
I started work by modelling one of the spider's main joints. Modelling was very simple: I used simple shapes such as lines, circles, ellipses, etc., and connected, cut and extruded them to achieve the results I was after (Fig.01 – Fig.03). I built up layer after layer of small details – screws, cogs, wheels, etc. – and connected them in a general form (Fig.04 & Fig.05).

Moving upwards I created new details for the leg, using the shapes already established and Editable Poly in some places where necessary. To make the foundation of the leg bigger and stronger, I created some kind of armour for it (Fig.06 & Fig.07). Details were simply repeated to build the forms of the spider, so the modelling of the leg didn't take very long (Fig.08 – Fig.12).

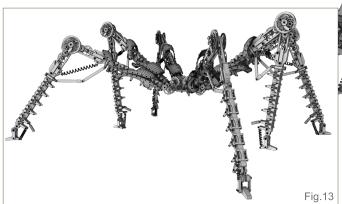


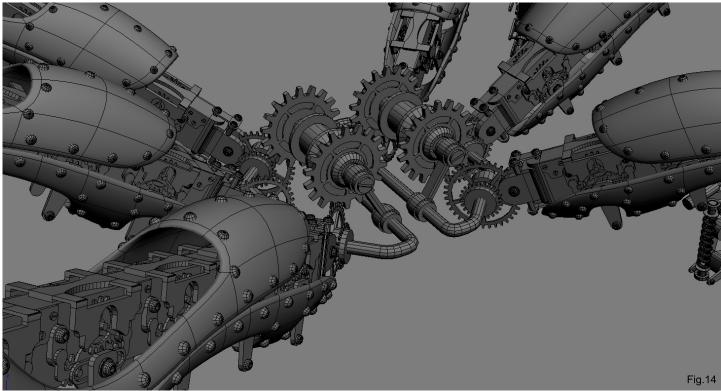




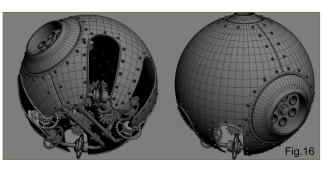




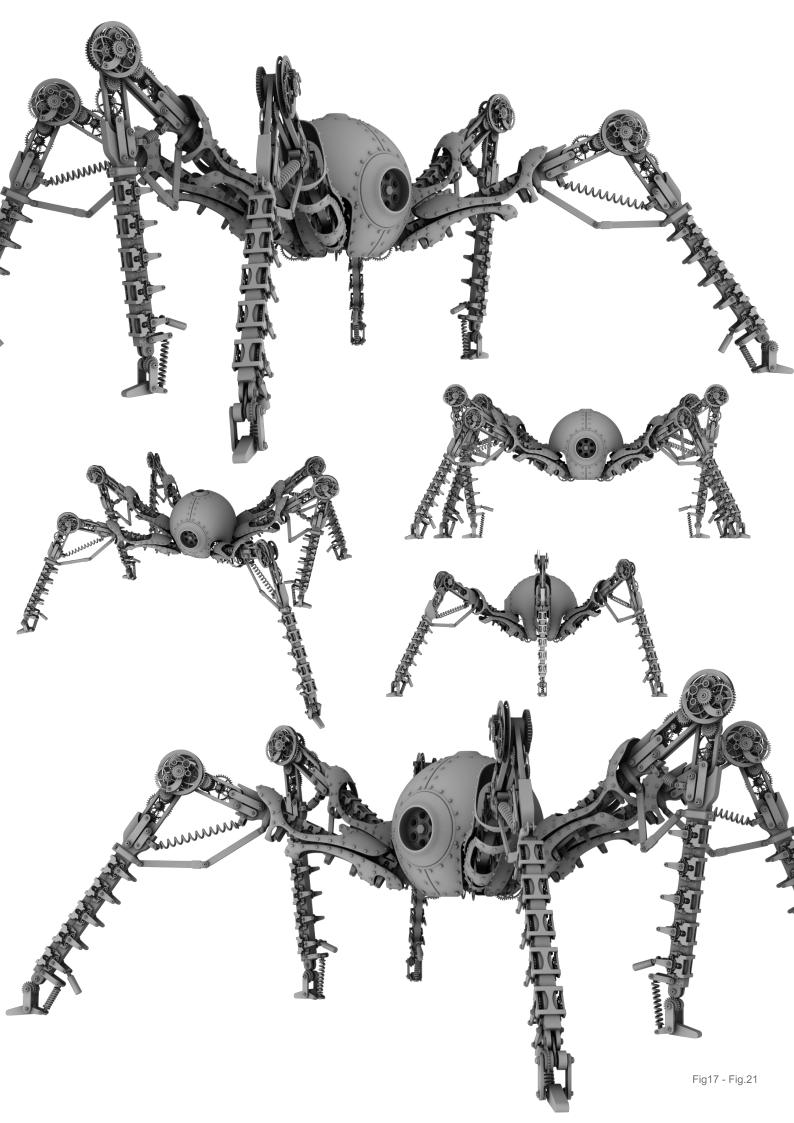




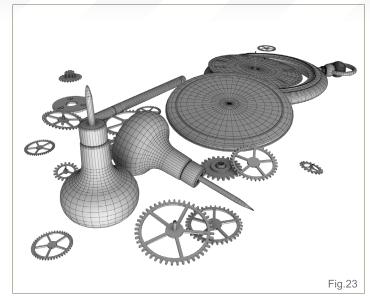


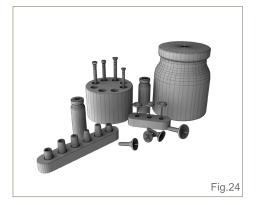


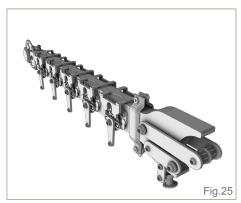
When I had one leg ready I linked the details of the leg to the basic joints so that I could move and rotate them. I then duplicated the leg to create six in total, and then started working on the foundation of the body (Fig.13 – Fig.15). I made the central part from a sphere I changed using Editable Poly, cutting off parts for the legs and other mechanisms (Fig.16 – Fig.21).











For the spider's environment I made it quite simply using primitives with Editable Poly (Fig.22 – Fig.25). In the end I had nearly one million polygons for the spider, and about one and a half million polygons for the entire scene (Fig.26).

#### **MATERIALS & TEXTURING**

For textures I used a collection from my library that I have gathered over time. I didn't use Unwrap UVW; I used simple planar, box and



#### SPIDER Making Of

cylindrical mapping because there were no difficult objects in the scene. Some additional textures were created in Photoshop, for example the picture in the book.

For the decoration on the metal boxes, and also on the ink pen and clock, I used a displacement map. For this purpose I created a few models to make up a pattern and then rendered a ZDepth pass, which gave me maps of the heights (Fig.27 – Fig.29).

#### "THE MAIN TASK WAS TO GET THE CORRECT PROPERTIES OF MATERIALS IN THE SCENE"

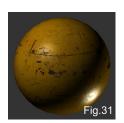
Ispent most of my time at this stage creating materials. The main task was to get the correct

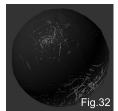






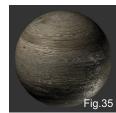


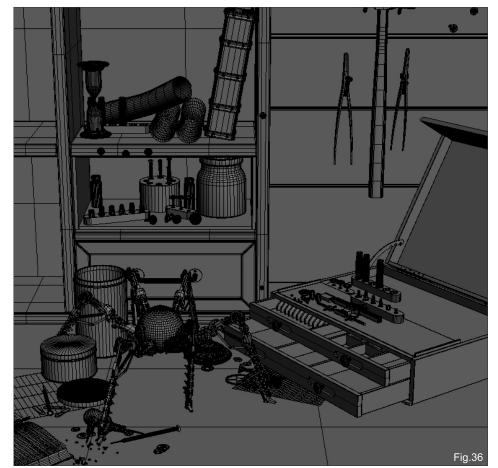


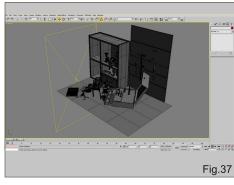








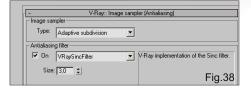




properties of materials in the scene, in particular for the metal because there was so much of it being used (Fig.30 – Fig.35).

#### LIGHTING & RENDERING

For the lighting in the scene, I chose V-Ray. I wanted to create a feeling of presence of the spider in a small room. I used one large source V-Ray Plane, which was the basic light, something like a window (Fig.36 & Fig.37). I also used an HDRI map for GI environment and reflection, which created nice reflections in the metallic details and also gave the image an interesting atmosphere.





- V-Ray:: Indirect illumination (GI)	
☑ On	Post-processing
GI caustics	Saturation: 1,0 💲 🗸 Save maps per frame
☐ Reflective	Contrast: 1,0 💲
▼ Refractive	Contrast base: 0,5
Primary bounces	
Multiplier: 1,0	GI engine: Irradiance map
Secondary bounces	
Multiplier: 1,0 ♣	GI engine: Light cache
	Fig.40

I pretty much used the standard properties in V-Ray: I used Adaptive subdivision image sampler; for Primary bounces I selected Irradiance map, and Light cache was chosen for Secondary bounces (Fig.38 – Fig.43). The picture was rendered at 3600 by 2700 pixels in size; it tools about 10 hours to render (Fig.44).

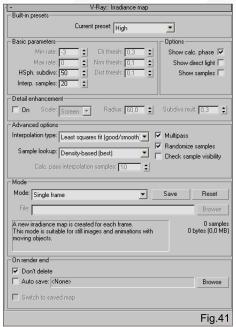
#### POST-PRODUCTION

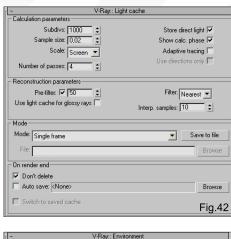
With the final render ready, I went into Photoshop to do some post processing work on the image. I decided that I needed to somehow select the spider from the scene, and so to do this I rendered a ZDepth channel which created focus on the spider (Fig.45).

For the smoke in the scene, I created it with FumeFX and applied it above the basic layer in Multiply blending mode (Fig.46 – also see Movie.01). I also did some colour correction and used a glow effect to make the image not too bright and a little more washed out. Finally, I used a vignetting effect and chromatic aberration to make the picture look more realistic and believable (Fig.47 – Fig.49). And there you have it, the Spider image was complete. Thanks for reading!

#### Andrew Averkin

For more from this artist please contact him at: andrewaverkin@yahoo.com





















Chapter Two Productions specialises in high resolution visuals for Advertising, Marketing and Product Design.

### chapter two

The creative process is often an adventure, every challenge is different. Incorporating new ideas and changes of direction is part of that challenge; we need to be flexible and responsive - and so do the tools we use.

When turning design sketches into 3D models we always start with Power NURBS – being able to create fully adjustable parametric models allows us the freedom to experiment and mould the design as we go, safe in the knowledge that it will render with faultless curves and allow us to backtrack and make changes at any time.

At Chapter Two our desire is to create beautiful images - nPower helps us achieve that goal.



Find out more about chapter.two at <a href="http://chaptertwo.co.uk/">http://chaptertwo.co.uk/</a>
To find out how nPowerSoftware can help your CG workflow visit us at <a href="http://www.npowersoftware.com">www.npowersoftware.com</a>







# WATING FOR THE STORM

#### Created In:

3ds Max, V-Ray & Photoshop

I'm 35 years old and I leave in Xanthi, Greece where I work as a graphic designer. Xanthi is a small town in the north part of Greece and the old part of it is filled with aged buildings, which are what inspired me to make some 3D scenes.

I've been working with 3D graphics with my wife (www.kouki1.deviantart.com) for six years as a freelancer. This particular project fulfilled my personal ambition to create a realistic image with aged buildings, and the main inspiration came from a model that I found on Board4All.cz. I wanted to create it from the beginning, blend it with water, and give the sense of an abandoned village, just like the ones we might see in the

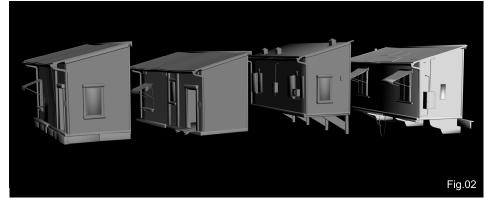
### "The fun part began when I started to work with materials."

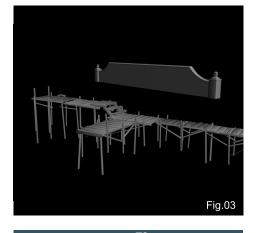
ancient town of Fenghuang, China.

I made some sketches before I started work in 3D. With my chosen sketch (Fig.01), I started up 3ds Max where I then began working on the models from standard primitives and using some basic modifiers like Lathe, Bevel, and the Unwrap UVW modifier. I created just four buildings and copied them with different parameters (Fig.02). Some extra models were also necessary in order to complete the project (Fig.03).

The fun part began when I started to work with materials. I like working with the Unwrap modifier and transferring all of my unwrapped renders into Photoshop where I can then blend many different kinds of aged textures to my liking (Fig.04).









For the lighting in my scene I used a Target
Directional Light, but I worked further on the
lighting once in Photoshop because I had to
blend the final render with the background
image which I used from the stock library by
Pierre Laurent (www.cat-in-the-stock.deviantart.
com). I could have done this work in 3ds Max,
but I decided I could control the lighting blend
better and more quickly in Photoshop without
having to render all the time to check the final
result.

#### "I WANTED TO PORTRAY A SENSE OF ABANDONMENT"

For the scene I used Adaptive DMC as an image sampler, the V-Ray Lanczos filter as an antialiasing filter, Irradiance map for the primary bounces, and Brute Force as secondary bounces. The V-Ray Irradiance map was set at medium with 50 Hsph Subdivisions and 40 Interp. Samples, and no environment lights were used at all. I also rendered some other

elements, like Vray Alpha, Vray Atmosphere, Vray Global Illumination, Vray Diffuse Filter and Render ID, which I used as extra layers later on in Photoshop.

When I was finished with my first render (Fig.05) and before I used the materials, the scene looked very bright, like a sunny day was about to come, but my goal was actually quite the opposite! I wanted to portray a sense of abandonment in a small village with a storm on its approach. So I applied all the basic materials in 3ds Max because the light always looks different after I apply them (Fig.06), and then re-evaluated the image.

The rest of the work was done in Photoshop where I continued to work with materials. I also painted some extra parts, like ropes hanging from the buildings and some dead trees behind the buildings. The dying trees work in contrast with the thriving ecosystem featured in the



background image, and in my opinion this helps make the scene look a little spookier.

As a finishing touch I played with Curves layers to achieve the most appropriate looking atmosphere for the scene and the story (Fig.07).

Thanks for reading, please be sure to visit my webpage for further information about me and for more examples of my work. Thank you!





# GEORGE KRALLIS

For more from this artist visit http://geograpcics.deviantart.com/ or contact george.krallis@yahoo.gr





DIGITAL ART MASTERS NOLUME

Focal Press

With the release of 3DTotal's latest book Digital Art Masters: Volume 3, we have some exclusive chapters for you...

This book is more than just an artwork book. Not only does it feature full-colour, full-page images, but each artist has given a detailed description, in their own words, of the creation process behind each piece of published artwork. And they've done it especially for this book!

This month we feature:

"Gros Nap" by Laurent Pierlot



### GROSNAP

BY LAURENT PIERLOT



BY LAURENT PIERLOT

The ideas and inspiration for this

The ideas and inspiration for the

The ideas and inspiration for the

The costumes and paintings

from the Napoceonic period, with

the intrincia defails of their costumes and accessories,

and the obsession for perpoduce natural lighting in their

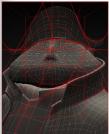
portraits. Art history has been an important part of my

sound background and is always a major source of

reference in my work.

Before starting, I did a little book and internet research for partings and portraits from partities such as Goya. Under O'Allerouth Modes also provide a migro recrute imagination in this case I looked at judicities from Berry Lymbon, in which Selence Models and partition in the case I looked at judicities from Berry from sunplicit or candles, and American Mozert from Decelor Miles Ferminia From Dece models also noticed how the making played a very important part, and as I wanted for howe a stock of humon ir my flower too. I decided to make him fat and wearing heavy makeup.

It was also a good reason to have fun in ZBrush with a lot of skin folds and wrinkles, with refined facial feature in the center of the face. The posing and general attitu





SKETCHING
The best way to start a picture is to do one or more sketches to define the idea exactly
as you have it in mind. You don't really need color at this point, but it's important to work
on the general style and composition (Fig.01).

SCENE LAYOUT AND MODELING
For the modeling part, I always start by building a layout of the scene using very simple
geometry and shapes – no detail whatsoever at this point. This gives me great freedom
for the most critical phase of the modeling process; the composition of the picture.

The following shots of the "Gros Nap" book pages are featured here in full-resolution and can be read by zooming in...

When building the layout, I look for the relationship and balance between volumes and space, for example how the shapes relate to each other, and I make sure my general proportions are corned by Uncoking out the base models: a lake define the center of interest and try to find a harmonious flow for the eye to look a by doing a quick paintover with the main axes and directions (Fig.02).

At this point, the camera needed to be locked to allow me to prepare for some of the UVs and camera projections for the mapping. A low-res scene was critical for this part of the process, and once everything was in place I knew exactly where I needed to work on specific details.

For the detailing part, most of it was done using ZBrush, and by importing the full-res mesh from ZBrush into Max. I know this makes it an expensive process, but it enabled me to have exactly the same quality in ZBrush and in Max. When I imported the mesh I used the OBJ format











When using ZBrush, I by to stay way from the classical 30 modeling quality and go for a more traditional day-sculpted feel. To do this, I subdivide the low-res mesh as much as I can from the beginning, and start sculpting I with the city tool as if it was a rough piece of day (Fig.13-41, I mainly use the rate loot with broad and large strokes to block out the main features, slowly reducing the size of the dos as I refer the stappes and smooth out the bumps. During the process it was morphated for the Organ standard start profession that such as a start of the stappes and smooth out the bumps. During the process it was and smooth out the bumps. During the process it was and smooth out the bumps. During the process it was and smooth out the bumps. During the process it was and smooth out the bumps. During the process it was and smooth out the bumps. During the subdivisions.

It's important to have a solid base of bigger folds and volumes before you start working on particular details, as this will help you to find the unique characteristics and proportions of your model. I also never he sitate to stop what I'm doing and start over the soutping process from scratch several times, rather than spending too much time fixing something I don't like.

For the embroidery details, I masked some parts of the object in ZBrush using alpha maps and then extracted those masked areas using the extract tools in ZBrush. Then I just had to refine those newly created subtools.

For this particular artwork, I ddn't have a very precise idea of the colors and style for the dothing and accessories. To make it easy for me to decide, I usually that seems lime to be severall parthorest using the models I have so that (the head in this case) (Fig.64). This skey was or little and very effector, if a quick way of "finding" the style, colors and details before starting to sought. It was also a good way to define the permat model and prepare for the rendering/lighting process!

TEXTURING, LIGHTING AND POST PRODUCTION
For the lighting it was quite simple: I used Merital Ray's Dulydigt system and final gathering for the render, and an HORI map on a sphere for the environmental lighting and reflections. I created a very diffused lighting with soft shadows and added a Spot light on the right side, behind the character, to give him a rim light and to get some subsurface on his ear.

When working with the Brazil renderer. I always feel the need to moder separate passes for the reflections, key light, rimitight and antiverlighting, and then composite everything in Fusion. This technique can give you more corder, but with Metal Riley just entered one pass with everything together, which I find is the best way to take that darwing or the Final Cathering option, and it will also save you a lot of time!

It will always take some time to fine-tune your materials and get them to look realistic; the most efficient way I've found is to set up my lighting with one basic material before adding colors and tectures (Fig. 63). This way you can be sure that your lighting is correct before adjusting the materials, usually starting with the bump and specular first.

e materials and maps I used the Arch Design materials that come with Mental Ray. These



terials are really well made and work perfectly with the daylight system. With just a r textures and some adjustments you'll get some good results, fast!

For the embroidery on his chest (Fig.96) I used the basic copper material with only a bump and a specular map. I also like to blend materials together using the blend material in Max with a mask (Fig.07). This technique allows me to control the two



CARTOON

CARTOON

materials independently and therefore emphasized the contrast and richly detailed aspect of his clothing. I used the FastSkin material for his face and painted the maps in Photoshop using a camera-mapping projection (Fig.

I'm never completely satisfied with the results I get from 3D renders, and when I'm doing my own artwork I don't want to spend too much time doing maps and render tests, so I usually do a lot of defilling and equityments in Priodotop, I will, for example, fix all the UV mapping problems that I get have using lieable testines, or I'll add some specular touches and details on the golden parts. In this case, some extra facial features, so also listoids and eyebrone, were added. I also used Priodotop to refine the lighting, accentainties the contrast and focus of the picture by darkening the sides of the image, recentificing the attention.

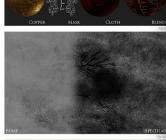
For the last step, I took the image into Fusion for a final compositing and funing process. In this case, I added a bit of atmosphere, some depth of field, and a few filters, such as Glow, Unsharp Mask and color correctors.

#### CONCLUSION

CONCLUSION

For me, the main purpose of doing my own artwork is always to learn and improve mer techniques, but it is always to learn and improve mer techniques, but it is also to work on personal subjects without he time and art direction constraints that you get in classical production work. Livact to do a for drawing and sudgring before I stated working with Zebush and 50 in general. Those, adong with ant history, are bases that fary artist will need to develop experience and sensibilities in.

ZBrush gave me the opportunity to transpose my 20 art into 3D without losing the character and particularity of my style. I like to explore the possibility of mixing 2D and





3D media in my work, to try to avoid spending too moth time doing hardcore 3D modeling that must work from every angle. The goal is to have fun doing something that is creative and unique, using all the toots and techniques available!

It's difficult to share in just a few lines what you have learned through years of training, and the sensitivity that you have developed from studying and creating art, but I hope this "making of" will help you in your quest to becoming a better artist.

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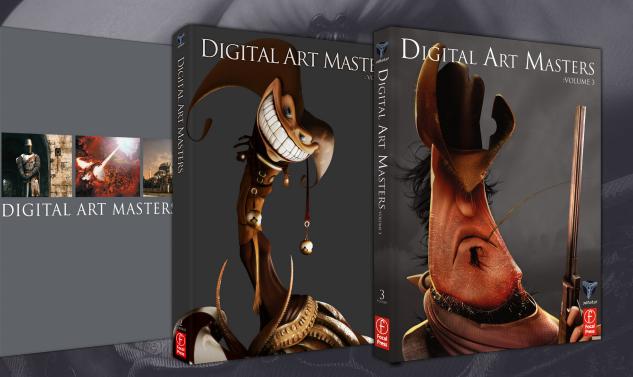








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Issue 047 July 2009





# NEXT GEN CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

# CHAPTER 1 – LOW POLY MODELLING

This chapter is divided into two categories, the first of which focuses on using ZBrush to create a low-poly sculpt from ZSpheres to approximate the proportions of the creature concept. The second section takes and imports this mesh into the appropriate software and explains the principles and importance of optimisation.

CHAPTER 2 – HIGH-POLY MODELLING PART 1 | AUG 09

CHAPTER 3 – HIGH-POLY MODELLING PART 2 | SEP 09

CHAPTER 4 – MAPPING / UNWRAPPING | OCT 09

CHAPTER 5 - NORMAL MAPPING - TEXTURING | NOV 09

CHAPTER 6 – MATERIALS, LIGHTING & RENDERING | DEC 09







# NEXT GEN CHARACTER CREATION SERIES

#### PART 1A

Software Used: ZBrush

There has never been a better time to create a next-gen creature. Tools like ZBrush, Mudbox, and 3ds Max are all weapons in our arsenal, allowing us to create believable, realistic, and detailed creatures that were previously too complex to even be considered.

We will begin this tutorial series by looking at creating a base mesh for our creature, designed by Richard Tilbury at 3DTotal (Fig.00). Using a combination of ZBrush and a variety of software packages, we will create a base mesh from ZSpheres, then retopologise and perfect our mesh in 3ds Max, Maya, LightWave and mode

Since coming onto the market, ZBrush has revolutionised the video games industry. Detail that was previously only possible through meticulous hand painting can now be done quickly and easily because of this programme. Organic characters are now able to look just as realistic and stunning as their high-poly counterparts. ZSpheres are a wonderful way to create a quick, simple base mesh that can be retopologised (the process of creating new topology on a mesh) and refined in a general 3D application.

1. To create a mesh using ZSpheres, we'll first drag one out onto the canvas, and then proceed to add more ZSpheres off of the original. This will build up the character in the same way we would with bones. It's important with ZSpheres to plan out the construction of your character before you start. The original ZSphere should act as the pelvis or waist, with additional ZSpheres coming off to form the limbs and midsection.

Fig 00

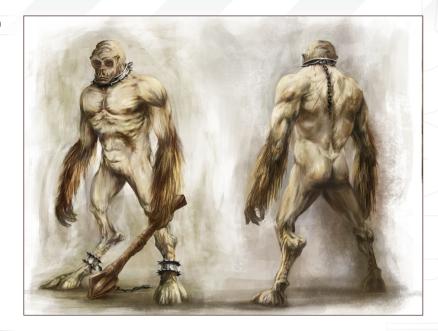
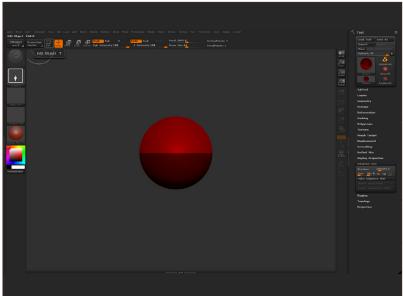
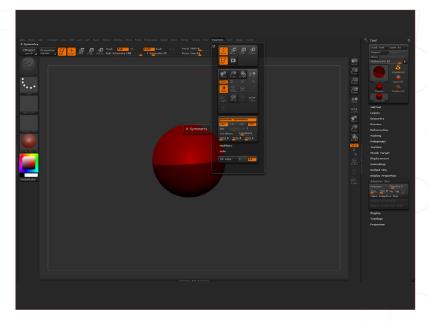


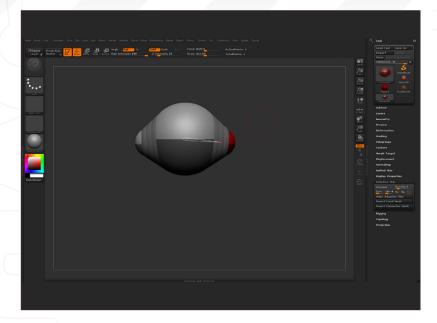
Fig 01











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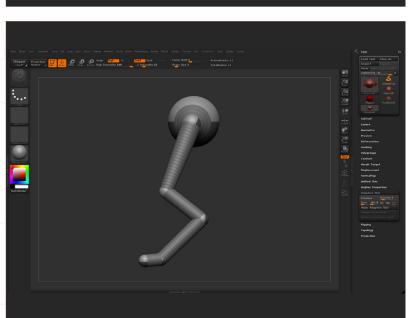


Fig 03

First we click on the ZSphere icon in the tool palette, then left-click and drag to place a ZSphere onto the canvas. Release the left-click, and then hit the Edit button [Q]. Now our ZSphere is placed and editable, and we can go on to add new ZSpheres off of this original (Fig.01).

2. To save time and make our job easier we can use symmetry to automatically create the opposite side of the model as we work on only one side. To enable this in ZBrush simply press [X] or go to Tool > Symmetry > Activate Symmetry, and make sure the X button is highlighted. If you now hover over the model, you will see another cursor on the opposite side that mirrors the actions of the original cursor that we're manipulating (Fig.02).

Fig 04

- Click and drag on the right side of the ZSphere to create what will be the hip section (Fig.03).
- **4.** Create a new ZSphere off of the last one by using the same click and drag technique. This new ZSphere will act as the first knee joint (**Fig.04**).

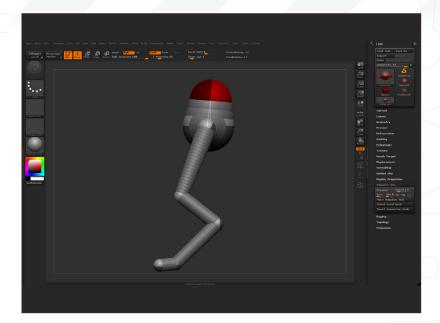
Fig 05

5. We'll now use the brush move tools to position the section we just created. At the top of the window (providing you are using the default ZBrush interface), there are buttons labelled, Edit, Draw, Move, Scale, and Rotate. Click on the Move button and right-click over the model. Make sure the draw size is small, as a large draw size acts as a soft selection and will move other parts of the model as well. Decrease the draw size to the minimum and move your mouse away from the menu. Select the ZSphere we just created and drag it downwards and into position (Fig.05).



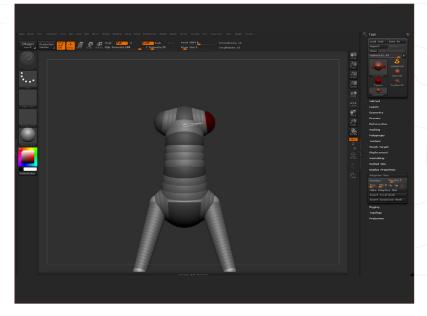
6. Now create a new ZSphere on the bottom of the knee joint, remembering to create it on the ZSphere itself and not on the intersection. Position this as shown and go on to create another two ZSpheres to act as the end of the leg and foot bones. We are going to move on to creating the mid-spinal sections and the chest. Create another three ZSpheres on top of the pelvis and position them as shown, using the Move tool as before (Fig.06).

Fig 06



7. Create new ZSpheres on the side of the upmost ZSphere to act as the clavicle, or shoulder area. I find that creating these sections, as opposed to just using that last sphere as the elbow, gives a nicer curvature for the underarm and shoulder areas once the model is meshed (Fig.07).

Fig 07



8. Now we go on to create two ZSpheres on top of the upmost middle sphere to act as the neck and head. It's important to position the head section straight up, as the topology of the top of the sphere lends itself to the top of the head, with the face being built on the front (Fig.08).

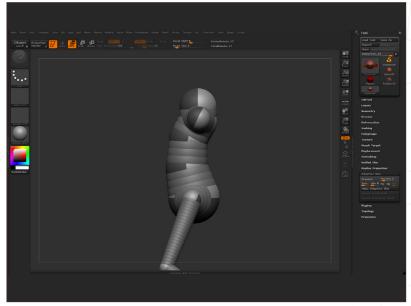




Fig 09

**9**. It's now time to create the arms, which will be built using the same methods as before. We create three sections to form the elbow, wrist, and hand (**Fig.09a & Fig.09b**).

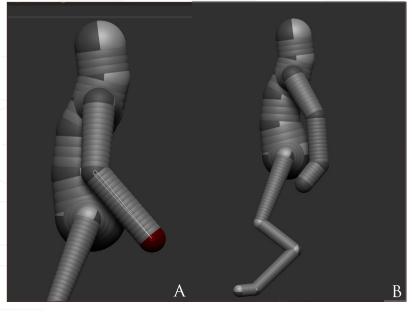


Fig 10

10. The last ZSphere to be placed is the one on the back of the lower knee joint, duplicating the bone that sticks out in the concept drawing (Fig.10a & Fig.10b). Once all of the ZSpheres are placed, we can move into the refining stage, part of which is creating the hands.

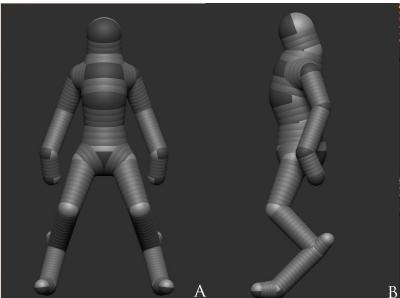


Fig 11a

11. Surprisingly quickly, we now have the whole character built and blocked out, and it's time to go over it with a tweaking pass. Use the Scale and Move tools to try and match the concept art in proportions, pose and scale. The closer we get now, the easier the retopology work will be.

A ZSphere model is nothing until it's meshed, and that's where Adaptive Skin comes in.

Adaptive Skin is a method for creating a usable model from ZSpheres. It also comes with the handy option of previewing the model before creation. Open the Tool menu and find the Adaptive Skin palette.





Fig 11b

There are plenty of confusing options in the palette, so here is a quick explanation of their functions (explanations of almost any tool in ZBrush can also be found by hovering over the tool and holding down Ctrl). Under the Adaptive Skin menu (Fig.11a) we have the:

- Preview button, which turns on and off our meshing. You can use the hot-key [A] to enable and disable this. It's very useful to keep checking the mesh to see how your ZSpheres are looking.
- Density, which calculates the number of subdivisions that the mesh should have. A density setting of one will be very low poly; a setting of two will be four times that, and so on.
- Ires (Intersection resolution), which is the number of consecutive ZSpheres that will be used to create a single object when the mesh is converted into polygons. This can be visualised by thinking of one sphere with a two-segment chain on either side. With an Ires of 0, each sphere will turn into individual spheres with a few joining polygons to connect them together. An Ires setting of one will turn the three middle spheres into one flowing cylindrical mesh, with the outer two spheres still maintaining their spherical shape.
- Mbr (Membrane Curvature), which adjusts
  the smoothness in the T- and L-shaped
  intersections. The higher the setting, the
  smoother the curve will be, whilst a low
  setting will maintain the shape of the right
  angle.
- MC (Minimal skin to child), which ignores
  the child\* of the section of the object,
  using it to connect two parts together but
  not contributing any polygons. This allows
  smooth transitions between new branches
  and can help eliminate twisting and
  collapsing.

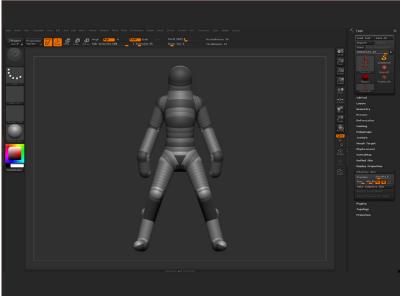


Fig 11c

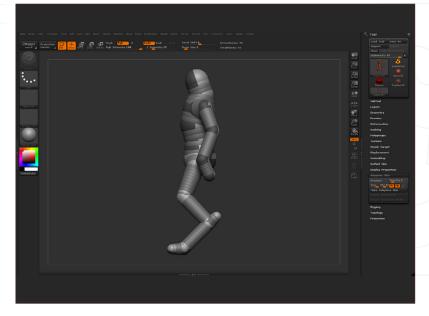
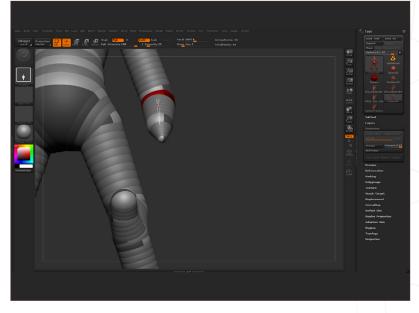
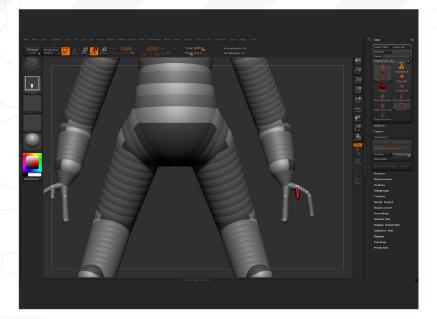


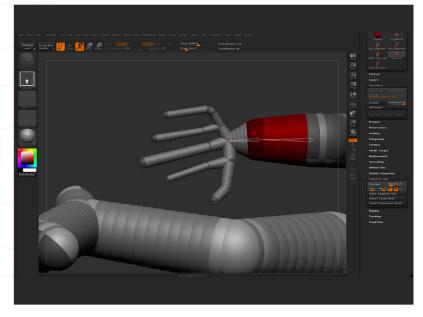
Fig 12a

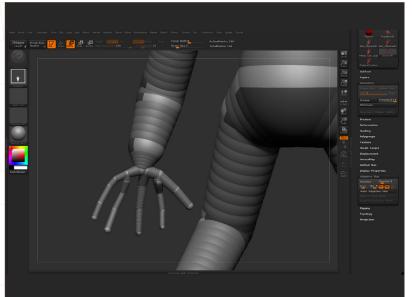


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3dcreative

Fig 12b

- MP (Minimal skin to parent), which ignores
  the parent\*\* of the section of the object,
  using it to connect two parts together but
  not contributing any polygons. This allows
  smooth transitions between new branches
  and can help eliminate twisting and
  collapsing.
- PD (Pre-divide), which lets you specify a pre-division resolution to match objects which are attached using connector mesh or local mesh features.
- \* A ZSphere created off another ZSphere is known as a "child" object.
- \*\* The original ZSphere is known as the parent (think of it as a mother and daughter holding hands!)

Once you understand the features, Adaptive Skin is not too complicated, and it's a very quick way to block out a character, animal, alien – or even a car! So now that we have a good set of Adaptive Skin settings, we need to modify the mesh a little to make it optimal for animation and speed up the next optimisation section.

Place new ZSpheres at the join areas of the model, namely the shoulder, the crotch, and optionally the neck. Placing a sphere on either side of the knee and elbow joints gives us three edge loops close together – the optimal amount for bending in animation. You can add a ZSphere to an existing section by holding control and clicking on the section while in edit mode (Fig.11b – Fig.11c).

12. The next – and final – stage is to create the hand. The process is roughly the same as with the whole character but it needs to be a little more precise in the layout of the ZSpheres. We are creating mid-sections that will serve to create the palm and finger joints (Fig.12a – Fig.12d).

Fig 12d

Fig 12c



13. Follow along using the video and screenshots as references to lay down the ZSpheres. Once all are in place, it's important to check the adaptive skin [A] and adjust the hand to anatomically correct proportions as much as possible. Creating a natural, relaxed pose here will be of great benefit to us later (Fig.13).

**Free Movie:** You can download the movie here, or by clicking on the Free Movies icon at the end of the tutorial.

14. Our character base mesh is now built and ready to be exported into our 3D application.

No UVs have been set up yet, as we will do that inside our 3D application later. Before we

can export we must turn our preview mesh into

a usable one by simply clicking the Make ...

(Fig.14a).

This just created a duplicate model, which ZBrush swapped the active tool to and began using as the primary model. This new model needs to be converted to a PolyMesh3D object which we can export. Under the Tool menu, click Make Polymesh3D (Fig.14b).

Now all that is left is to click Export (in the Tool menu), give it a name, and save into your project location ready for the next step.

Fig 13

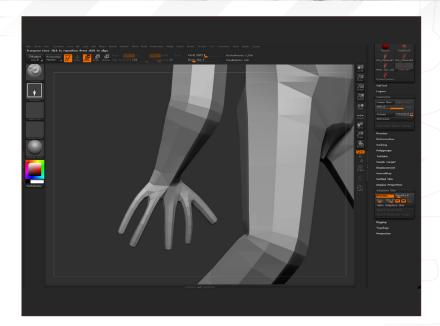


Fig 14a



Fig 14b



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Fig 15

mesh so far (Fig.15). With the knowledge learnt from this section you will be able to create a base mesh for almost any organic object and know how to create an optimal mesh using Adaptive Skin! In the next step we will take the exported model into our 3D application, give it new topology, and perfect the shapes and forms ready for sculpting and animation. Please continuing reading for Part 1B.

## NEXT GEN CHARACTER CREATION

Creature Concept by RICHARD TILBURY

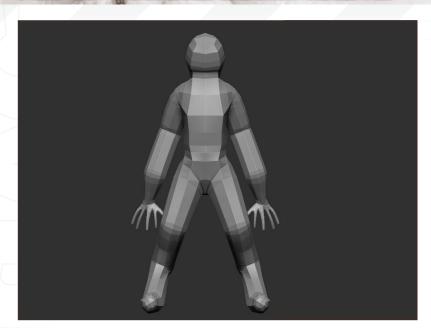
# Tutorial by: JOSEPH HARFORD

For more from this artist visit:

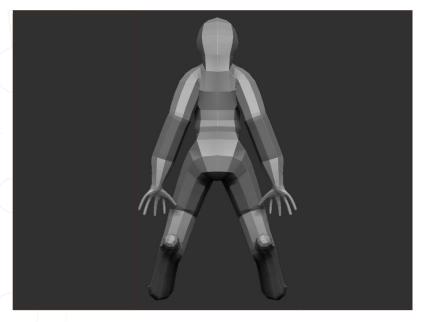
http://josephharford.com/

Or contact them:

Josephharford@googlemail.com













# CHARACTER CREATION SERIES

#### PART 1B

Software Used: 3dsmax

Optimisation and topology are vitally important in real-time character creation. Whether it's for video games, the web, or interactive media, polygon count and topology should be high on your priority list. If you have a budget of 10,000 tris for a character (most game studios work with tri count as opposed to poly count), plus clothes and accessories, there are a number of considerations to decide on while building. Things like: How am I going to spend those tris wisely? Which areas should have the most tris? How can I go about creating animation-friendly topology with as few tris as possible and how can I keep the silhouette as smooth and edgefree as possible with the minimum amount of tris? These questions are vital, and should be asked all throughout the process of modelling a character. They should be considered at each stage and should be present in all your decisions during this part.

I am using 3ds Max 2009, but older and newer versions will not be too different. On the left of the screenshot I have a modelling toolbar with very useful scripts and features by a genius Maxscript artist, Remus Juncu (http://313designstudio.com/rappatools) (Fig.00). Common selection shortcuts, view shortcuts, edge loop tools, wire colouring and much more are all part of this absolutely free toolset, and I find them extremely useful while modelling or retopologising models. Feel free to go and try them out and see if they can improve your workflow. I won't be using any of the functions during the tutorial except the view and selection shortcuts, so don't worry if you haven't got them installed.

1. We'll start off by importing the model into 3ds

Fig.00

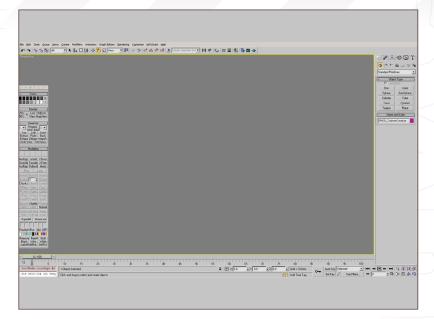
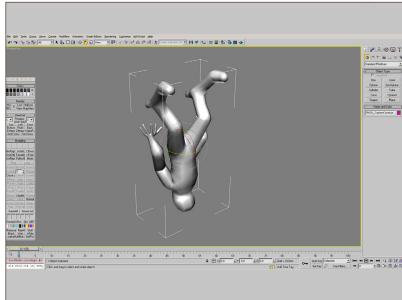
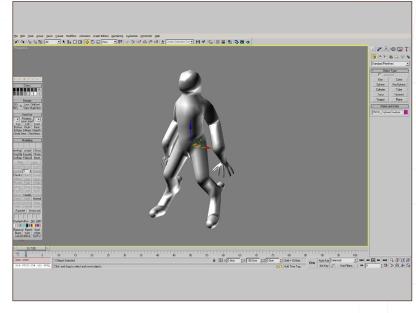


Fig 01







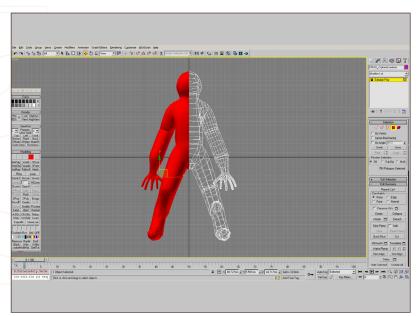


2. When I import with the default options the model application is flipped 180 degrees, upside down. In the co-ordinates boxes at the bottom of the screen, enter 180 into the Y box so the model will rotate right-side up (Fig.02).

3. Now it's important to convert our model from editable mesh to editable poly. There are a few reasons for doing this: editable poly is a newer and more complete modelling solution, providing us with access to the newer 3ds Max modelling tools; It also eliminates the possibility of double-sided polys and extruded edges, which in most game and real-time engines will cause errors or fail to export. Right-click over our viewport and click Convert To > Convert to Editable Poly (Fig.03).

4. Unlike clay or wood sculpting, 3D artists have the luxury of symmetry modelling, with one side automatically updating as we work. To do this in 3ds Max we need to remove one side of the model and apply a symmetry modifier. Select half of the mesh after switching to the front view (default hotkey [F]). Make sure that the Ignore Backfacing option is turned off. Selecting half of the model by using a rectangular selection will select both the polygons facing and not facing our camera (Fig.04a – Fig.04b).

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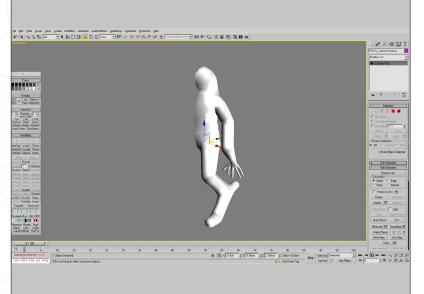


Fig 04b

Fig 04a





5. On the right of our Max screen we have the modifier stack. This is a collection of all the modifiers that can be applied to our currently selected object. Click on the down arrow to open the dropdown box, and select Symmetry. You can also drop down the box and start typing the name of the modifier to quickly select it. The modifier is applied to the object and we can adjust the settings.

In the settings for the symmetry modifier, the correct axis to use is X, as we want the model to be mirrored in the X plane. We want Weld Seam to be enabled, as this will weld each vertex along the symmetry plane together. The threshold setting decides the distance a vert has to be from its mirrored version to be welded together: a too high threshold results in collapsing of too many verts together; a too low setting results in un-welded vertices. Reduce this number to zero, and while holding Alt, drag the spinner upwards until you notice all the vertices have been welded (holding Alt while manipulating a spinner in Max gives you a finer control of the increments adjusted) (Fig.05).

6. Click Editable Poly underneath the newly added modifier. We will work underneath the symmetry modifier for the remainder of this section, collapsing again when ready to export, with no asymmetry being put into the model pre-high poly.

We can move onto cleaning our model now, ready for adding and modifying the topology. The area I always start with is underneath the arms. I want all areas of the mesh to be visible, with no intersecting polygons. Go ahead and enter Vertex sub-selection mode [1] and select vertices in the arm region. Select all that are intersecting, plus a few more in the surrounding area to ensure a smooth transition (Fig.06).

7. Now, as we did in the earlier step, find the Relax modifier from our modifier stack. Apply this to the model by selecting it from the list and adjust the settings to match the ones in the image (Fig.07). As mentioned before, we are

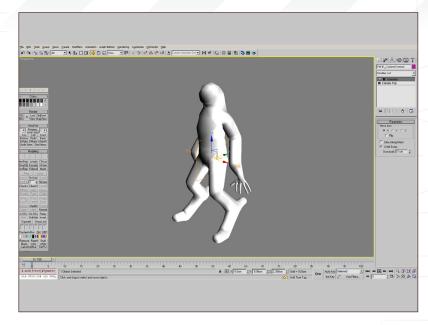


Fig 06

Fig 05

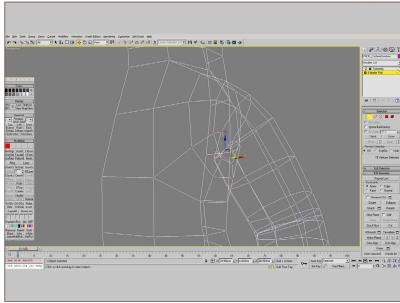
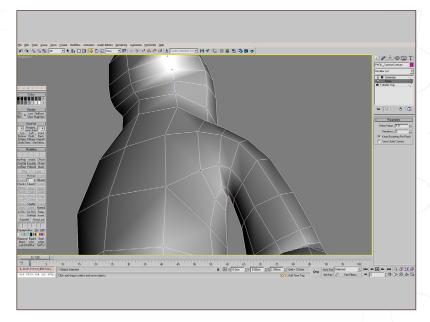


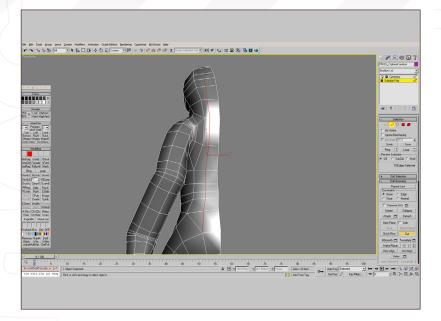
Fig 07



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Fig 08

trying to eliminate any overlaps or intersections to assess the topology properly.

8. With the shoulder area relaxed, collapse the Relax modifier by right-clicking on it in the list and choosing Collapse To. We now have a collapsed object, without affecting the Symmetry modifier. Go on to relax and collapse any other areas of the mesh that are intersecting. This might include – but is not limited to – the elbows, crotch, backs of knees, and the hand.

In this step I have added edges running from the lower back to the neck. The head simply doesn't have enough detail to provide a clean and smooth silhouette. The broadness of the back dictates our need for more edges in that area (Fig.08).

9. Here I am shaping the new edges into place while in Vertex mode. If you enter Screen mode for translation of objects (Ctrl + Alt + Right-click and select Screen) then you can simply drag vertices around one by one without selecting and using the manipulator (Fig.09).

Fig 10

Fig 09

10. I've added in an edge in the neck to show the sternomastoid muscle. This will start off the flow of topology I want in this area. I'm not worrying too much about keep everything quads (four-sided polygons) at this point as I want to rough out the flow of the edges and then tidy up once that is in place (Fig.10).





11. I'm adding a row of edges in to mark the underside of the chest. The edge loop also runs into the shoulder area to mark the insertion point of the main shoulder muscles. This gives great deformation when the character lifts up his arm. I'm adding in these edges using the Cut tool, which I have on a shortcut key as it's a commonly used tool (Fig.11).

A neat and timesaving trick is to enable snapping when cutting (default hotkey [S]). Right-click on the snap icon in the top toolbar (it will highlight on and off when you press S), then turn all options off, except vertex and edge.

When you normally cut, it can be difficult to see if you're on a vertex or an edge, and many loose vertices get created due to this, leaving the model quite messy after a while. It then requires a lot of welding verts and deleting edges to clean it up. An alternative is to try the above method technique of snapping, which will lock your cut along edges and snap to vertices.

- 12. I go on to further relax the elbow and wrist sections. As you can see, the topology of the hand leaves a little to be desired. The wrist will not animate well this way and the fingers need a lot of work to get them to a good stage for sculpting and animation. The crotch area topology came out almost perfect, showing the power of ZSpheres (Fig.12)!
- 13. I add an edge here to define the wrist and topside of the hand. I remove a few edges on the hand by right-clicking, holding down Ctrl and clicking Remove. By holding Ctrl and clicking Remove, it removes edges and vertices at once - a clean remove. In general, you should always be removing this way to keep the whole model clean, as we did with our snap cutting (Fig.13).

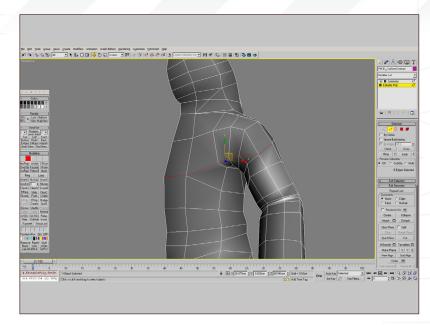
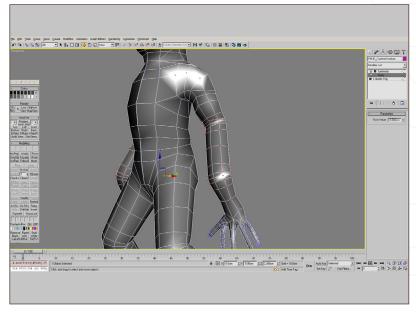
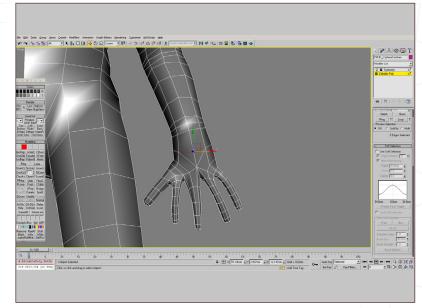


Fig 12

Fig 11









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Fig 14a

14. I'm working on the underside of the hand, re-flowing the topology to form the two major padded sections of the palm. It's important to note here the flow of the edges around the thumb, as this will later be very efficient in pivoting the thumb around. All of this is done

removing edges to optimize the flow (Fig.14a & Fig.14b).

in the same manner as before, adding and

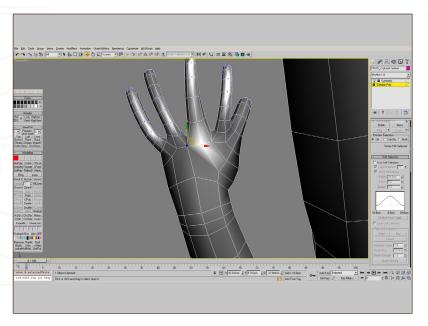
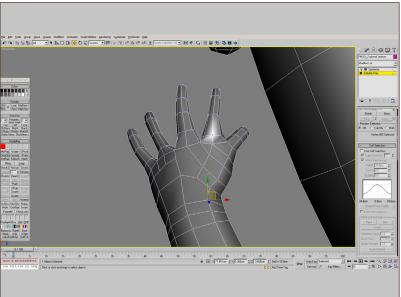


Fig 14b

Fig 15



bones and sinews do anatomically. I reduce the edge loops around the fingers to adjust the joints and a connector loop near the knuckle. I'm also making an attempt to clean up the hand by removing and adding edges. The aim of this is

to end up with all quads. Of course, as this is for real-time, quads are not as essential as for film or other models. The main issue is that triangles and 5+ sided polygons do not smooth well. As real-time models are not smoothed with turbo or meshsmooth we do not have that consideration. In fact, for real-time models, triangles are a tool

**15**. The top of the hand topology should flow out of the fingers and into the wrist, just as the

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that we can use to reduce the overall poly count or create points like the elbow or ankle bones without using too many polygons (Fig.15).





16. To further work on the hand I need to hide a large portion of the mesh. Sometimes it can be difficult to see the area you're working on when the rest of the mesh is in the way. Select everything but the hand up to the elbow and in the modifier stack, scroll down, and press the Hide Selected button (Fig.16a & Fig.16b).

Fig 16a

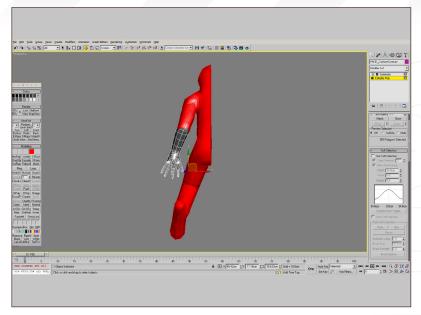
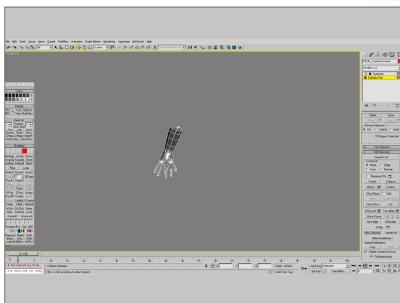
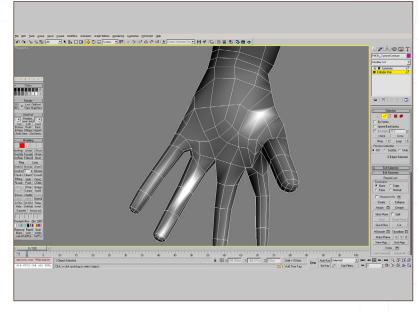


Fig 16b



17. I create points on each knuckle to reduce the poly count and allow the hand to flow into the wrist without adding additional polygons (Fig.17a - Fig.17b). Hands are notoriously difficult to model as they can bend and move into a number of awkward positions. As people are so aware subconsciously of the anatomy of hands, as we are of faces, it becomes easy for observers to spot mistakes automatically. Unfortunately, without repeated study we don't have enough information in our heads to fix those mistakes by eye. For that reason I advocate dedicating a portion of your time to studying the anatomy of the hand, the muscles and bones that drive it, and how they interact with each other. After a number of drawings and

Fig 17a



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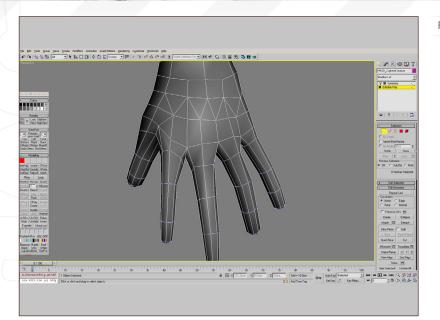
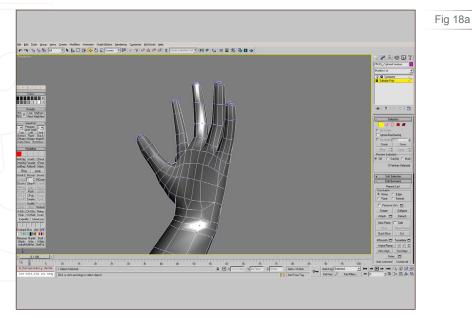


Fig 17b sculptures the information is burned into your brain for use in the future. The more information we store, the more we can recall at a later date, allowing us to work more creatively, efficiently

and with more confidence.



18. I work further on the palm and thumb connection point. As this will be the model to be sculpted in ZBrush later, it's important to maintain an equal size of polygons. The only areas of the hand that need more numerous and smaller polygons are the joints, wrist and perhaps the fingertips (Fig.18a – Fig.18b).

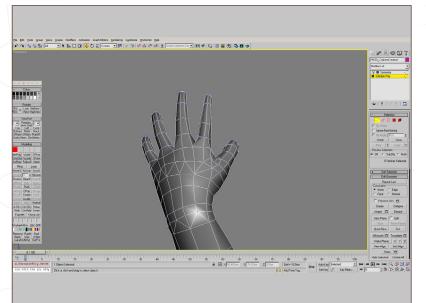


Fig 18b



19. Select the edge loops that make up the joints of the fingers and thumb – two around each finger, and one on the thumb; right-click over the model and hit the little icon next to the Chamfer button. Selecting the Chamfer text will use the default settings without popping up a menu box, whereas we want to click the icon so we can dictate those settings ourselves.

Increase the size of the Chamfer to approximately the size in the second screenshot here (Fig19a – Fig.19c), and increase the number of segments to 2. Now we have created optimal topology for our finger joints that will also deform well.

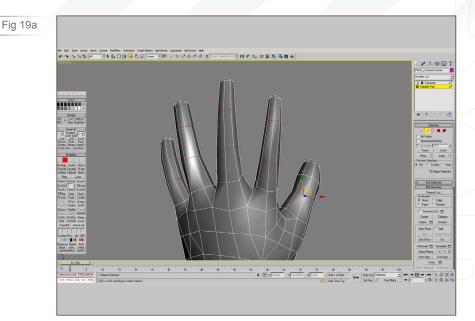


Fig 19b

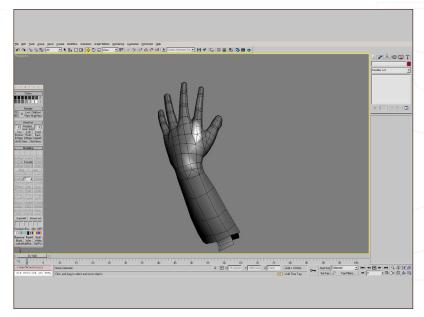
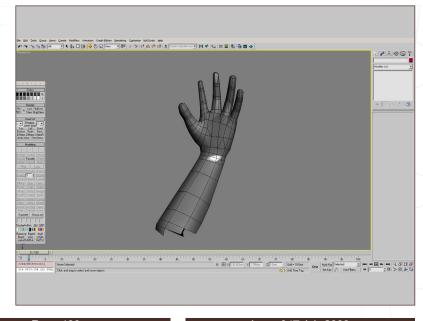


Fig 19c







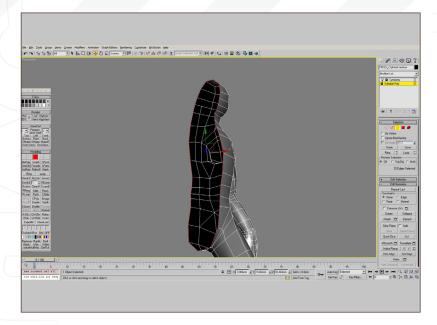


Fig 20a

20. After doing small tweaks on the model throughout this entire process, some of the centre line vertices have been moved off centre. The welding no longer matches up and a clear seam is visible. To get this back to an accurate state go to the Editable Poly level of your model and press [3] on your keyboard, or select the Edge Borders sub-selection mode. Click once on one of the edges on the centreline and Max will select the whole loop.

With the loop selected, in the modifier panel

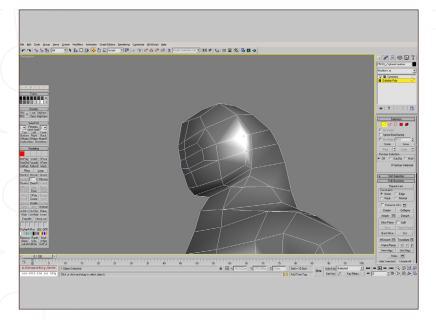
find the Make Planar button. On the right of the button are three letters corresponding to the various axes. These buttons take the current selection and line every vertex up in the chosen axis. As the symmetry modifier is in the X plane, we can go ahead and select the X icon. You should see the edges line up as you click. We are not quite done, because the lining up averaged all the vertex locations and now they all lie in that position. Again in the co-ordinates input boxes along the bottom of the screen, type zero in the X box. This puts all the vertices back along the X axis and our symmetry modifier works once again (Fig.20a & Fig.20b).

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Fig 21

Fig 20b

21. Finally, it's time to work on the head again, and we start by blocking in the eye areas. If the eye holes are in the right place it makes it very easy to locate the nose, mouth, and ear (Fig.21).





follows (Fig.22a - Fig.22b):

# Part1: NEXT GEN CHARACTER CREATION SERIES

- 22. I apply a new material to the object to see how it looks in a silhouette form. During the whole process of building the model we should be looking out to make sure the silhouette looks interesting, proportionally correct, and as close to the concept as possible. To apply a new material to check this there are two ways, as
  - The first is to simply press [M] to open the Material Editor and change the diffuse colour of the applied material to pure black.
     Then deselect the model and view the silhouette.
  - The other and perhaps better way is to select the model, and above the modifier panel where the model's name is written, click on the colour swatch next to it. This is the colour of the wireframe, the object's default colour without material. If you apply a pure black colour here you can then go to the Display tab (the fifth tab from the left), and click on the checkbox for Object Colour. The model will now be displayed simply with the colour of the object and no lighting. This is very useful for working on the silhouette of the model and versatile in that you can simply switch back to material colour when you want to go back to a lit model view.
- 23. The legs are going to need some attention before proceeding, and I'm going to start by simplifying the connection between the sticking out bone and that second joint it's more twisted than I would like it to be for a simple base mesh. I go about reworking the area; I remove a number of edge loops in the bone section, and in the foot also. It's important to think which areas will be deformed during walking or action with the character and put more polygons into those sections. Areas that will always remain static, and especially areas that will remain straight, need far less polygons (Fig.23).

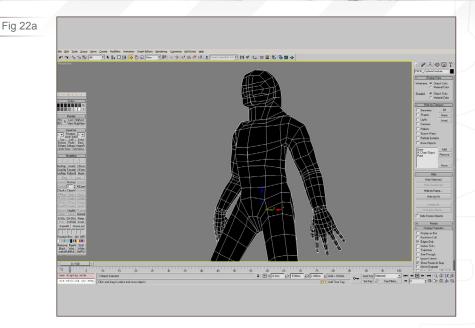
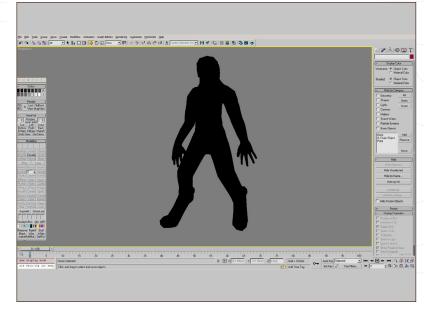


Fig 22b



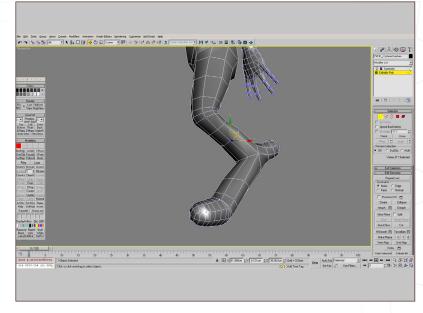






Fig 24

24. Flatten out the bottom of the foot and shape it so it resembles the concept art. It's important to note the foot is basically a hoof, and is solid. There are no toe areas, so the foot will not bend when walking. This means we can reduce the polygons on the topside of the foot by collapsing some edges and forming triangles (Fig.24).

Fig 25

25. Continuing the head, I'm going to put in edge loops that range from the bridge of the nose to the bottom of the chin. Even if it's not perfectly tidy, it's important to block out all the basic topology loops in the face so that we can later alter the shape and quickly add detail by inserting new edge loops (Fig.25). Just as with a nurbs model we might create these sections separately, stitch them together, and then add detail through isoparms.

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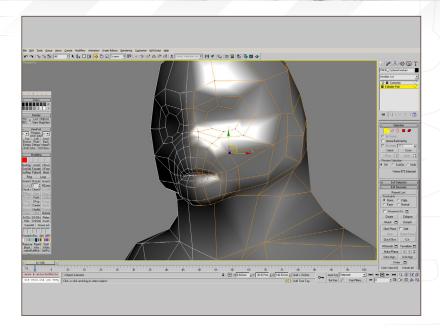
Fig 26

26. Now we're going to create the base for the eyes. Creating circular loops around the eyes makes it easy to add additional loops later, but also creates the most optimal topology to animate the eyes. Select the polygons around the eye and right-click over the model, selecting Inset. The cursor will change, and click-anddragging over the selected polygons will create a loop inside of the selected one (Fig.26).



27. Like the eyes, I'm going to create more loops inside of the mouth section. I create circular loops around the mouth, making sure to position them at key points that will affect the silhouette; for example, the top of the upper lip, which in its circular form will create the bottom part of the lower lip (Fig.27).

Fig 27

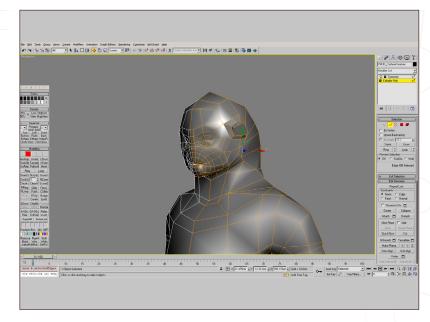


28. I've selected the newly created eye polygons and created another inset. The size of the inset does not matter here as we will right-click again on our object and hit Collapse. All selected polygons will now have been collapsed into a single vertex. I'm also insetting polygons on the side of the head to form the ear. We want the topology of the top and side of the head to flow into the ear naturally, as without the benefit of mesh/Turbosmooth, any ugly topology connecting to the ear at harsh angles will appear darkly coloured due to the way realtime engines handle smoothing groups (Fig.28).

Fig 28

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29. Add further loops to form the chin and jaw, making sure it follows the jaw line all the way up to the ear. As the nose does not really stick out of the character in the concept, we will not add topology for it. Rather, we will use the normal map from the high-poly sculpt alongside a good texture to achieve a realistic result. Not all detail needs to be in the base mesh, only detail that effects the silhouette, or will do when the character deforms (Fig.29).







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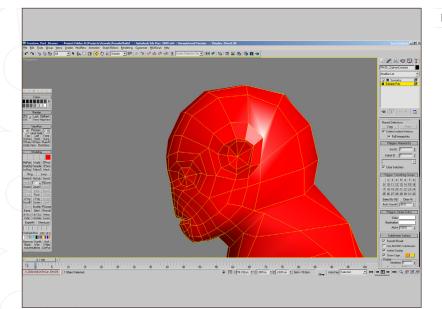


Fig 30

Fig 31

**30**. Let's not forget the back of the character. It's great to work on a specific area for a long time, but it's easy to get too focused on a particular area and go into too much detail before it's time. It's important to work the overall shape of the model and try to work in stages. Each stage should add another level of detail to your model, as if you were subdividing in ZBrush, or adding another level of smoothing. That means detail like the eyes, small muscles, or veins should all come at the end of the whole process (**Fig.30**).

31. I add a few more edges into the ear and continue to tidy up the area. As the image shows, the newly created polygons of the ear are not smoothing in the same way as the rest of the model. The reason for this is smoothing groups, an important part of real-time modelling as it gives us the opportunity to create hard edges and smooth surfaces without using more polygons. Smoothing groups tell the application how to display the model. A six-sided box with a smoothing group on each of the six sides looks like a standard box. If we apply only one smoothing group to the entire object, the programme will attempt to smooth it into one surface, instead of six, making the box appear somewhat spherical. As this is only a lighting effect and does not alter the polygon count or the actual model, it is simply an illusion. Because a silhouette is a shadow and lacks all forms of light, smoothing groups won't affect the appearance of the model's silhouette, which is just one more reason why it is so important to use silhouettes and smoothing groups in conjunction throughout the entire modelling

Setting up smoothing groups is not something we will do often with an organic character. It's much more common to use them for accessories, weapons, cars, and most game-ready models.

process (Fig.31).

**32**. Enter Polygon sub-selection mode and hit [Ctrl] + [A] to select all polygons of the model. Scroll down in the modifier panel to Polygon Smoothing Groups. The number one

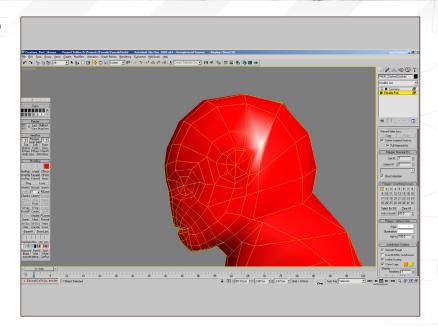
Fig 32a



3ds max

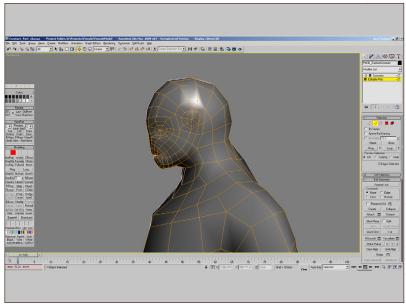
is invisible, which means that not every polygon is part of group one. We can therefore deduce that, because no other smoothing groups are invisible, the polygons that are not in group one are also not part of their own second smoothing group. In order to make sure the entire model is all part of the same smoothing group, simply click on the invisible 1 button and see the ear and eye areas smooth over (Fig.32a & Fig.32b).

Fig 32b

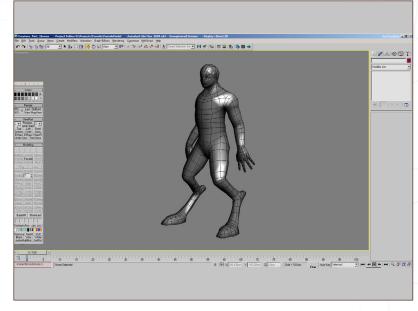


33. Applying the same principles we've used throughout the tutorial so far, I'm working on the neck area and shaping the back of the skull. I want the large neck muscles to be prominent in the base mesh and follow the muscles' direction so the area will animate well when the character turns his head (Fig.33).

Fig 33



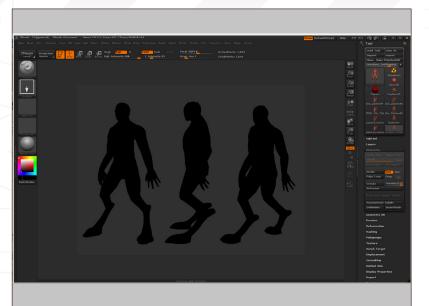
**34**. Continue to work on the model by tidying up all areas until you are left with mostly quads. If you do have triangles, ask yourself why they are there. They should only be there if they are performing a function, whether it be for the silhouette, polygon reduction, or to help deformation (**Fig.34**). It's good to ask yourself these questions throughout. If you don't, the programmers will later on.











**35**. For the final section of this part, I've used a combination of moving vertices using soft selection and hand pulling the model around to work further on matching the pose and proportions of the concept. What we have at the end is a base mesh that will not only work well for sculpting our high poly, but also animate well, run efficiently in our real-time engine, and look good from all distances due to our care and attention to the silhouette (**Fig.35**).

Next up is Part 2 – next month – in which we'll be sculpting the real meat of the character, muscles, veins and all!

# NEXT GEN CHARACTER CREATION

Creature Concpet by RICHARD TILBURY

Tutorial by:

JOSEPH HARFORD

For more from this artist visit:

http://josephharford.com/ Or contact them:

Josephharford@googlemail.com





# Eva Wild

# Female Characters Creation if their specialties in very detailed step by step procumaking this training suitable for artists of all levels.

#### Introduction:

The 'Eva Wild Series' – Our aim in this series is to provide comprehensive lessons to produce a complete fully rigged, textured and anatomically correct female character. This series fits well into 3 DVDs with 3 separate professional 3ds Max instructors taking you through each if their specialties in very detailed step by step processes making this training suitable for artists of all levels.



# Part 1 - Modelling:

- Complete step by step modelling of the Eva Wild character.
- Teaches the importance of studying human anatomy.
- Provides clear diagrams showing muscle flow and bone structure.
- 14 hours of comprehensive training.
- Suitable for artist of all levels.

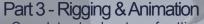




## Part 2 - Texturing, Mapping & Clothing:

- Complete step by step texturing process of the Eva Wild character.
- Modelling and Texturing of Eva Wild garments.
- Lighting the character.
- 4 hours and 47 mins of comprehensive training.
- Suitable for artist of all levels.





- Complete step by step of setting up a fully animatable rig for the Eva Wild character.
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- Creating a simple face morph.
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# NEXT GEN CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

# CHAPTER 1 – LOW POLY MODELLING

This chapter is divided into two categories, the first of which focuses on using ZBrush to create a low-poly sculpt from ZSpheres to approximate the proportions of the creature concept. The second section takes and imports this mesh into the appropriate software and explains the principles and importance of optimisation.

CHAPTER 2 – HIGH-POLY MODELLING PART 1 | AUG 09

CHAPTER 3 – HIGH-POLY MODELLING PART 2 | SEP 09

CHAPTER 4 - MAPPING / UNWRAPPING | OCT 09

CHAPTER 5 - NORMAL MAPPING - TEXTURING | NOV 09

Chapter 6 – Materials, Lighting & Rendering | Dec 09





# lightwave

# NEXT GEN CHARACTER CREATION SERIES

## PART 1A

Software Used: ZBrush

There has never been a better time to create a next-gen creature. Tools like ZBrush, Mudbox, and 3ds Max are all weapons in our arsenal, allowing us to create believable, realistic, and detailed creatures that were previously too complex to even be considered.

We will begin this tutorial series by looking at creating a base mesh for our creature, designed by Richard Tilbury at 3DTotal (Fig.00). Using a combination of ZBrush and a variety of software packages, we will create a base mesh from ZSpheres, then retopologise and perfect our mesh in 3ds Max, Maya, LightWave and modo.

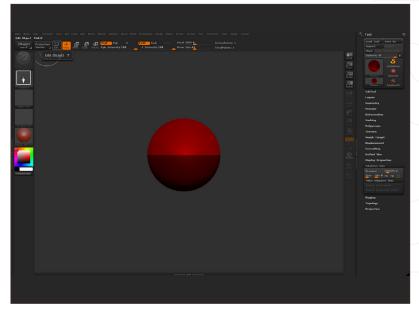
Since coming onto the market, ZBrush has revolutionised the video games industry. Detail that was previously only possible through meticulous hand painting can now be done quickly and easily because of this programme. Organic characters are now able to look just as realistic and stunning as their high-poly counterparts. ZSpheres are a wonderful way to create a quick, simple base mesh that can be retopologised (the process of creating new topology on a mesh) and refined in a general 3D application.

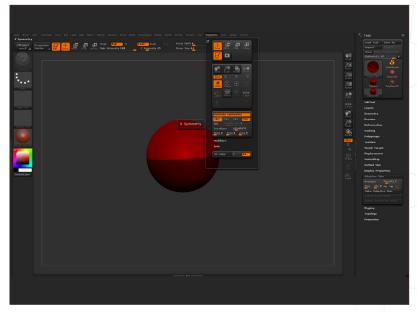
1. To create a mesh using ZSpheres, we'll first drag one out onto the canvas, and then proceed to add more ZSpheres off of the original. This will build up the character in the same way we would with bones. It's important with ZSpheres to plan out the construction of your character before you start. The original ZSphere should act as the pelvis or waist, with additional ZSpheres coming off to form the limbs and midsection.

Fig 00



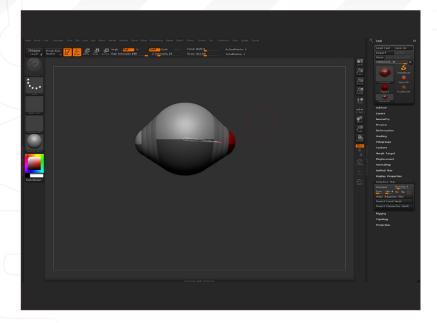
Fig 01











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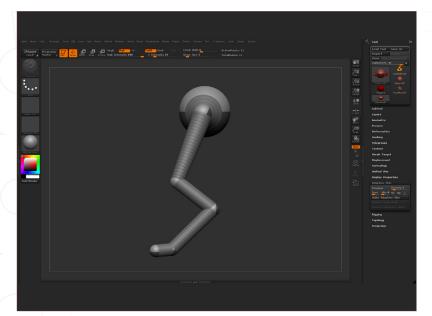


Fig 03

First we click on the ZSphere icon in the tool palette, then left-click and drag to place a ZSphere onto the canvas. Release the left-click, and then hit the Edit button [Q]. Now our ZSphere is placed and editable, and we can go on to add new ZSpheres off of this original (Fig.01).

2. To save time and make our job easier we can use symmetry to automatically create the opposite side of the model as we work on only one side. To enable this in ZBrush simply press [X] or go to Tool > Symmetry > Activate Symmetry, and make sure the X button is highlighted. If you now hover over the model, you will see another cursor on the opposite side that mirrors the actions of the original cursor that we're manipulating (Fig.02).

Fig 04

- Click and drag on the right side of the ZSphere to create what will be the hip section (Fig.03).
- **4.** Create a new ZSphere off of the last one by using the same click and drag technique. This new ZSphere will act as the first knee joint (**Fig.04**).

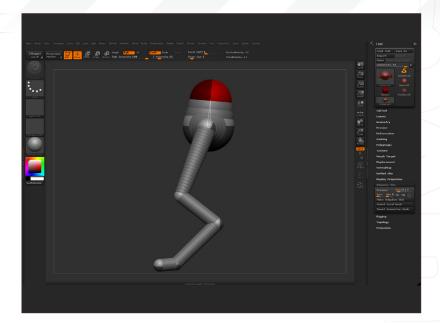
Fig 05

5. We'll now use the brush move tools to position the section we just created. At the top of the window (providing you are using the default ZBrush interface), there are buttons labelled, Edit, Draw, Move, Scale, and Rotate. Click on the Move button and right-click over the model. Make sure the draw size is small, as a large draw size acts as a soft selection and will move other parts of the model as well. Decrease the draw size to the minimum and move your mouse away from the menu. Select the ZSphere we just created and drag it downwards and into position (Fig.05).



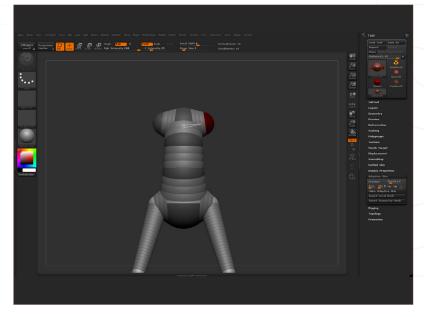
6. Now create a new ZSphere on the bottom of the knee joint, remembering to create it on the ZSphere itself and not on the intersection. Position this as shown and go on to create another two ZSpheres to act as the end of the leg and foot bones. We are going to move on to creating the mid-spinal sections and the chest. Create another three ZSpheres on top of the pelvis and position them as shown, using the Move tool as before (Fig.06).

Fig 06

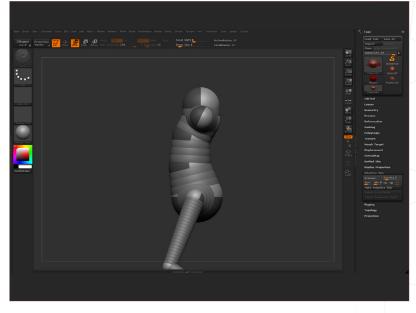


7. Create new ZSpheres on the side of the upmost ZSphere to act as the clavicle, or shoulder area. I find that creating these sections, as opposed to just using that last sphere as the elbow, gives a nicer curvature for the underarm and shoulder areas once the model is meshed (Fig.07).

Fig 07



8. Now we go on to create two ZSpheres on top of the upmost middle sphere to act as the neck and head. It's important to position the head section straight up, as the topology of the top of the sphere lends itself to the top of the head, with the face being built on the front (Fig.08).





**9**. It's now time to create the arms, which will be built using the same methods as before. We create three sections to form the elbow, wrist, and hand (**Fig.09a & Fig.09b**).

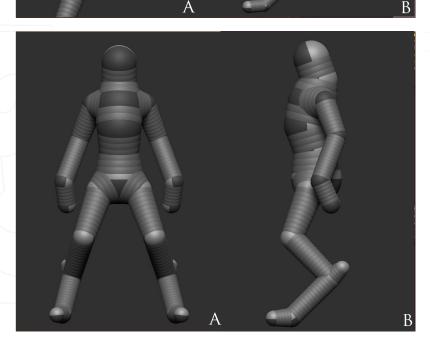


Fig 10

10. The last ZSphere to be placed is the one on the back of the lower knee joint, duplicating the bone that sticks out in the concept drawing (Fig.10a & Fig.10b). Once all of the ZSpheres are placed, we can move into the refining stage, part of which is creating the hands.



Fig 11a

11. Surprisingly quickly, we now have the whole character built and blocked out, and it's time to go over it with a tweaking pass. Use the Scale and Move tools to try and match the concept art in proportions, pose and scale. The closer we get now, the easier the retopology work will be.

A ZSphere model is nothing until it's meshed, and that's where Adaptive Skin comes in.

Adaptive Skin is a method for creating a usable model from ZSpheres. It also comes with the handy option of previewing the model before creation. Open the Tool menu and find the Adaptive Skin palette.



There are plenty of confusing options in the palette, so here is a quick explanation of their functions (explanations of almost any tool in ZBrush can also be found by hovering over the tool and holding down Ctrl). Under the Adaptive Skin menu (Fig.11a) we have the:

- · Preview button, which turns on and off our meshing. You can use the hot-key [A] to enable and disable this. It's very useful to keep checking the mesh to see how your ZSpheres are looking.
- Density, which calculates the number of subdivisions that the mesh should have. A density setting of one will be very low poly; a setting of two will be four times that, and so on.
- Ires (Intersection resolution), which is the number of consecutive ZSpheres that will be used to create a single object when the mesh is converted into polygons. This can be visualised by thinking of one sphere with a two-segment chain on either side. With an Ires of 0, each sphere will turn into individual spheres with a few joining polygons to connect them together. An Ires setting of one will turn the three middle spheres into one flowing cylindrical mesh, with the outer two spheres still maintaining their spherical shape.
- Mbr (Membrane Curvature), which adjusts the smoothness in the T- and L-shaped intersections. The higher the setting, the smoother the curve will be, whilst a low setting will maintain the shape of the right angle.
- · MC (Minimal skin to child), which ignores the child\* of the section of the object, using it to connect two parts together but not contributing any polygons. This allows smooth transitions between new branches and can help eliminate twisting and collapsing.

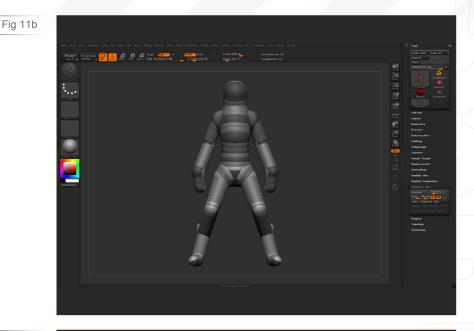


Fig 11c

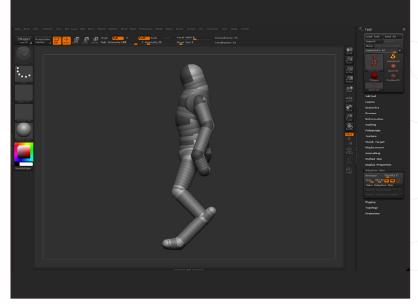
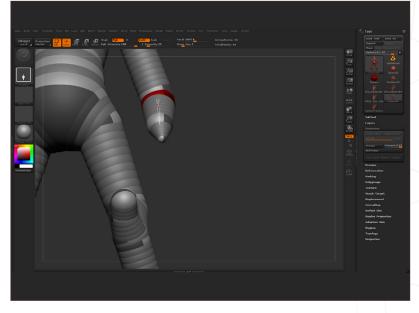
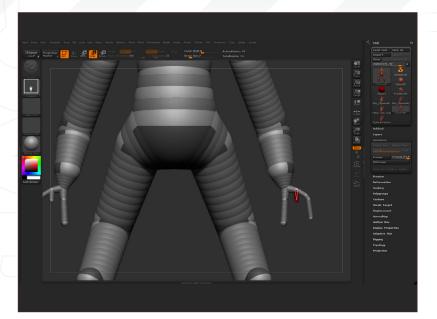


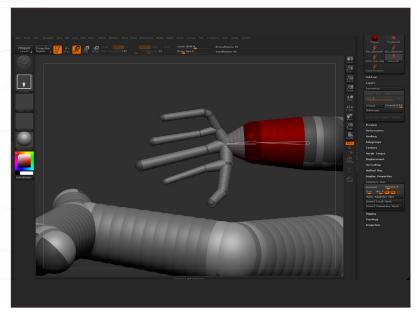
Fig 12a

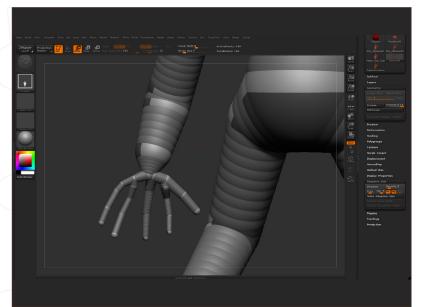


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Fig 12b

Fig 12c

- MP (Minimal skin to parent), which ignores the parent\*\* of the section of the object, using it to connect two parts together but not contributing any polygons. This allows smooth transitions between new branches and can help eliminate twisting and collapsing.
- PD (Pre-divide), which lets you specify a pre-division resolution to match objects which are attached using connector mesh or local mesh features.
- \* A ZSphere created off another ZSphere is known as a "child" object.
- \*\* The original ZSphere is known as the parent (think of it as a mother and daughter holding hands!)

Once you understand the features, Adaptive Skin is not too complicated, and it's a very quick way to block out a character, animal, alien – or even a car! So now that we have a good set of Adaptive Skin settings, we need to modify the mesh a little to make it optimal for animation and speed up the next optimisation section.

Place new ZSpheres at the join areas of the model, namely the shoulder, the crotch, and optionally the neck. Placing a sphere on either side of the knee and elbow joints gives us three edge loops close together – the optimal amount for bending in animation. You can add a ZSphere to an existing section by holding control and clicking on the section while in edit mode (Fig.11b – Fig.11c).

12. The next – and final – stage is to create the hand. The process is roughly the same as with the whole character but it needs to be a little more precise in the layout of the ZSpheres. We are creating mid-sections that will serve to create the palm and finger joints (Fig.12a –

Fig.12d).

Fig 12d



13. Follow along using the video and screenshots as references to lay down the ZSpheres. Once all are in place, it's important to check the adaptive skin [A] and adjust the hand to anatomically correct proportions as much as possible. Creating a natural, relaxed pose here will be of great benefit to us later (Fig.13).

Free Movie: You can download the movie here. or by clicking on the Free Movies icon at the end of the tutorial.

14. Our character base mesh is now built and ready to be exported into our 3D application. No UVs have been set up yet, as we will do that inside our 3D application later. Before we can export we must turn our preview mesh into a usable one by simply clicking the Make ...

(Fig.14a).

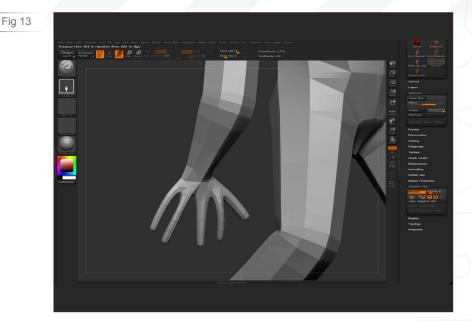


Fig 14a



This just created a duplicate model, which ZBrush swapped the active tool to and began using as the primary model. This new model needs to be converted to a PolyMesh3D object which we can export. Under the Tool menu, click Make Polymesh3D (Fig.14b).

Now all that is left is to click Export (in the Tool menu), give it a name, and save into your project location ready for the next step.

Fig 14b

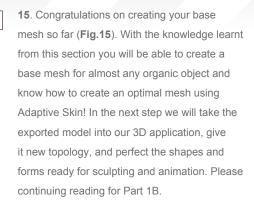


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Fig 15



# NEXT GEN CHARACTER CREATION

Creature Concept by RICHARD TILBURY

# Tutorial by: JOSEPH HARFORD

For more from this artist visit:

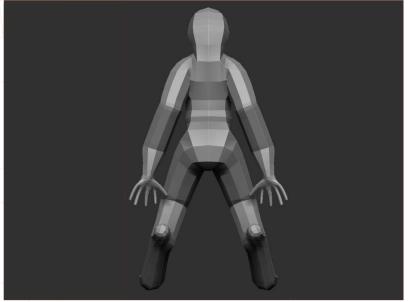
http://josephharford.com/

Or contact them:

Josephharford@googlemail.com













# CHARACTER CREATION SERIES

## PART 1B

Software Used: LightWave

Optimisation and topology are vitally important in real-time character creation. Whether it's for video games, the web, or interactive media, polygon count and topology should be high on your priority list. If you have a budget of 10,000 tris for a character (most game studios work with tri count as opposed to poly count), plus clothes and accessories, there are a number of considerations to decide on while building. Things like: How am I going to spend those tri's wisely? Which areas should have the most tri's? How can I go about creating animation-friendly topology with as few tri's as possible and how can I keep the silhouette as smooth and edgefree as possible with the minimum amount of tri's? These questions are vital, and should be asked all throughout the process of modelling a character. They should be considered at each stage and should be present in all your decisions during this part.

I'm going to be using LightWave 9.6, but if you are working with an older version please don't worry, as we won't be using any tools or plugins that aren't compatible with previous versions as far back 8.5. All the plugins/tools that I used are part of LightWave, so there is no need for anyone to download any third party tools or plugins.

We'll start off by importing the model into LightWave. Go to File > Load Object, and select the object created in Part 1A of this tutorial.

1. When I import with the default options the model is flipped 180 degrees, so simply press Shift + F6 to change the pivot mode to Origin, and press the R key twice to rotate the model 180 degrees (Fig.01).

Fig 01

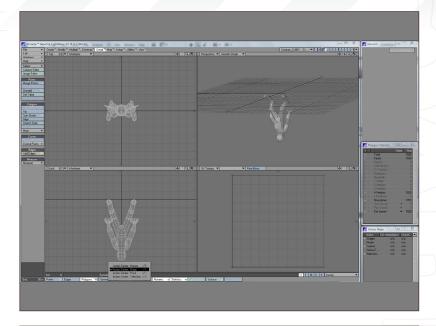


Fig 02a

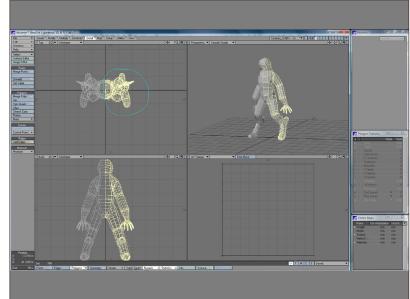
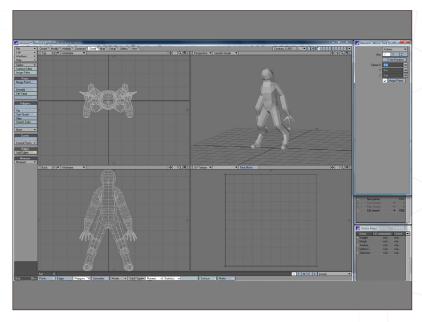


Fig 02b



Issue 047 July 2009

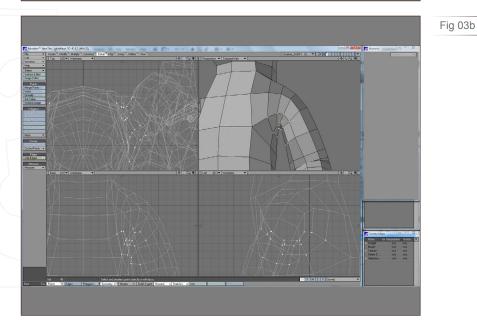
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- 2. The next step is to make the model symmetrical. To do this we need to remove one side of the model and mirror it. Select half of the mesh in the front view using the Lasso selection (right-click) and press Delete (Fig.02a). Now simply press Shift + V to activate the Symmetry tool, followed by the N key to bring up the numeric options window. Make sure the axis is set to X, centre is set to 0 metres on all 3 axes, and Merge Points is ticked. To activate Symmetry when you're modelling all you have to do is click the Symmetry button at the bottom of the screen, or press Shift + Y (Fig.02b).
- 3. We can move onto cleaning our model, ready for adding and modifying the topology. The area I want to start with is underneath the arms. I don't want there to be any intersecting polygons on the mesh. Enter Point Selection mode (Ctrl + G) and select vertices in the arm region (Fig.03a). Select all that are intersecting, plus a few more in the surrounding area to ensure a smooth transition. Bring up the Smooth polys options by pressing Shift + M, and set the Strength to 1.0 and Iterations to 70. Hit OK (Fig.03b).



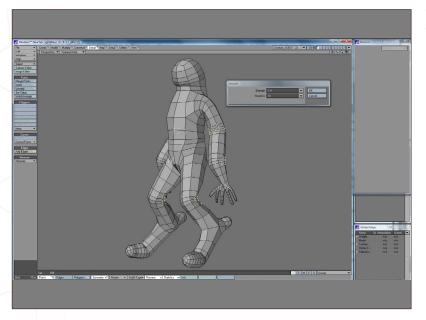


Fig 04

4. Use the same technique as previously described to relax the points or overlapping polys on the backs of the knees, elbows and wrists (Fig.04). You might want to use the point Drag tool (CTRL + T) to clean up some of the geometry after you've smoothed it out.

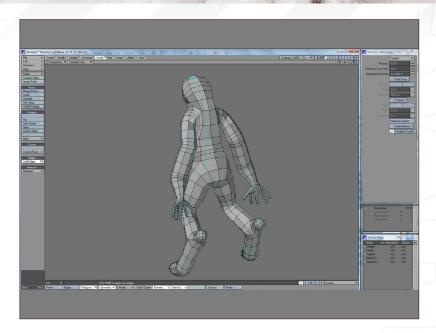


symmetry.

# Part1: NEXT GEN CHARACTER CREATION SERIES

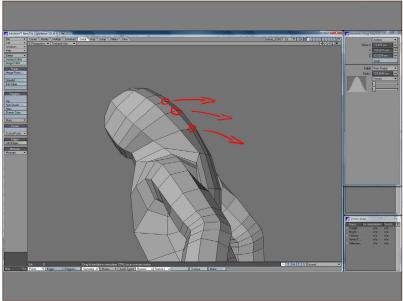
5. In this step I'm using Add Edges – Detail > Edges > Add Edges – to insert edges running from the lower back to the neck (the Add Edges used throughout this tutorial is standard with LightWave versions 9.3 and up; I haven't used any plugins that aren't standard to LightWave) (Fig.05). The head simply doesn't have enough detail to provide a clean and smooth silhouette. The broadness of the back dictates our need for more edges in that area. You will notice that the edges tool doesn't work with symmetry, so once you're done repeat step 2 to restore the

Fig 05

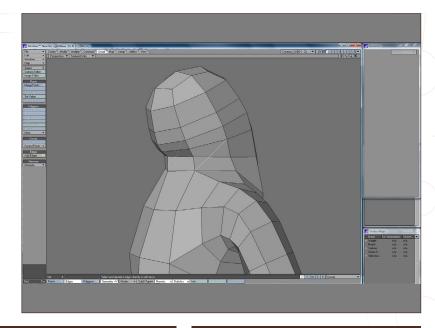


6. Here I am shaping the new edges into place while in Point mode, using the Drag tool (Fig.06).

Fig 06



7. I've added in an edge in the neck to show the sternomastoid muscle. This will start off the flow of topology I want in this area. I'm not worrying too much about keeping everything quads at this point as I want to rough out the flow of the edges and then tidy up once that is in place (Fig.07).







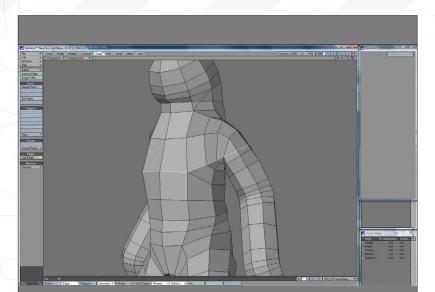


Fig 08

8. I'm adding a row of edges to mark the underside of the chest. The edge loop also runs into the shoulder area to mark the insertion point of the main shoulder muscles. This gives great deformation when the character lifts up his arm. I'm adding in these edges using the Add Edge tool (Fig.08).

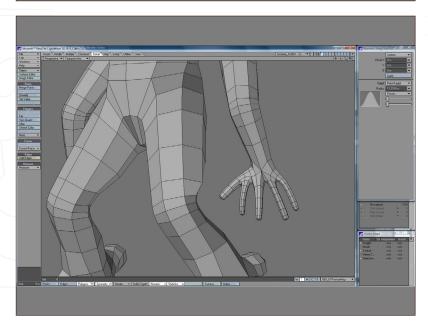


Fig 09

9. As you can see, the topology of the hand leaves a little to be desired. The wrist will not animate well this way, and the fingers need a lot of work to get them to a good stage for sculpting and animation. The crotch area topology came out almost perfect, showing the power of ZSpheres (Fig.09).

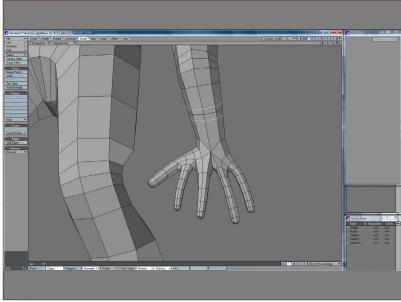


Fig 10

10. I add an edge here to define the wrist and topside of the hand (Fig.10). Now I'm starting work on the underside of the hand, re-flowing the topology to form the two major padded sections of the palm. It's important to note here the flow of the edges around the thumb, as this will later be very efficient in pivoting the thumb around. All of this is done in the same manner as before, using the Add Edges tool.



11. The top of the hand topology should flow out of the fingers and into the wrist, just as the bones and sinews do anatomically. I reduce the edge loops around the fingers to adjust the joints and add a connector loop near the knuckle (Fig.11a). I'm also making an attempt to clean up the hand by removing and adding edges. The aim of this is to end up with all quads. Of course, as this is for real-time, quads are not as essential as for film or other models. The main issue is that triangles and 5+ sided polygons do not smooth well; triangles are a tool that we can use to reduce the overall poly count or create points like the elbow or ankle bones without using too many polygons (Fig.11b).

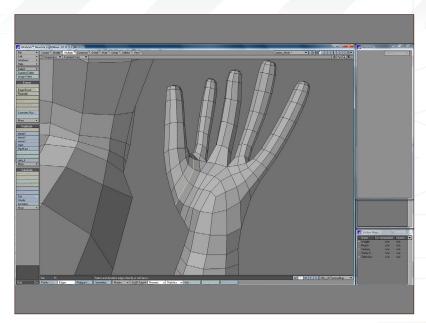
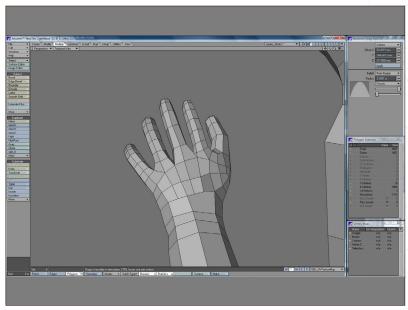
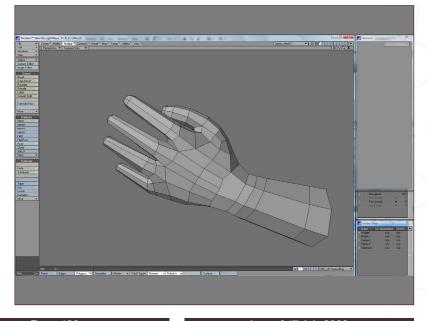


Fig 11b

Fig 11a



12. In order to add the loops for joints on the fingers, I remove the existing edges by using the BandGlue plugin. Simply select a polygon on either side of the edge you wish to remove, and select Construct > More > BandGlue (Fig.12).





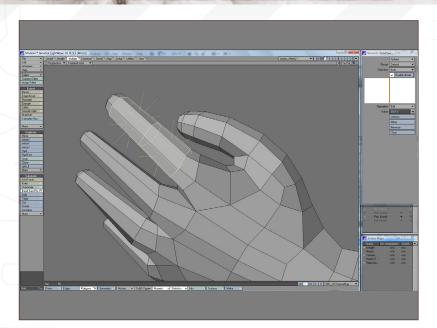


Fig 13

13. To put the edges back in I use Bandsaw Pro, which is pretty much the opposite of BandGlue; once again simply select the polygons on the loop of polys that you wish to add a new edge to, and go to Multiply > Subdivide > Bandsaw Pro. You can use the value slider to select the position of your new edge (Fig.13).

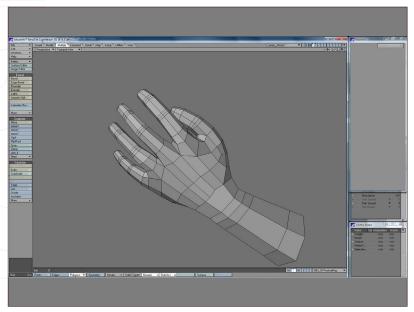


Fig 14

**14**. Here I've added additional edges to the joints using the same Bandsaw technique (**Fig.14**).

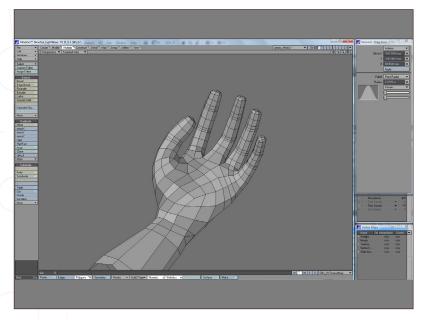


Fig 15

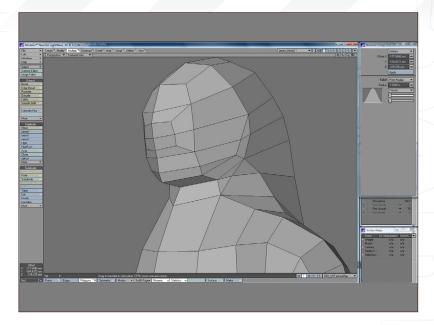
**15**. Finally, I add more edges in-between the joints, just to give a bit more resolution to our ZBrush mesh (**Fig.15**).



lightwave

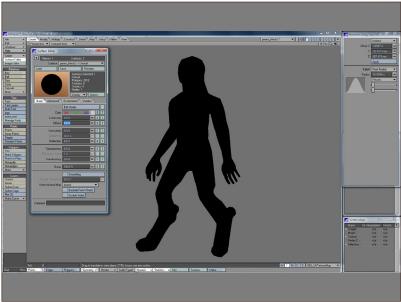
**16**. It's time to work on the head again, and we start by blocking in the eye areas. If the eye holes are in the right place it makes it very easy to locate the nose, mouth, and ear (**Fig.16**).

Fig 16

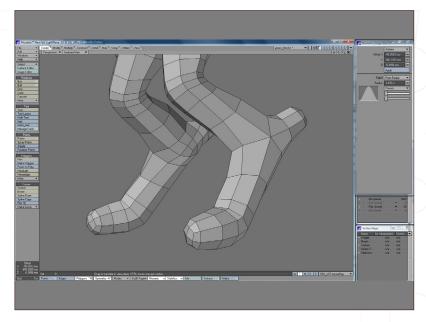


17. Apply a new material to the object to see how it looks in a silhouette form. During the whole process of building the model we should be making sure the silhouette looks interesting, is proportionally correct, and is as close to the concept as possible. The quickest way to check this is to simply set the Diffuse value in the Surface Editor to 0% (Fig.17).

Fig 17



18. The legs are going to need some attention before proceeding, and I'm going to start by simplifying the connection between the bone sticking out and that second joint – it's more twisted than I would like it to be for a simple base mesh. I go about reworking the area; I remove a number of edge loops in the bone section and in the foot, also using BandGlue. It's important to consider which areas will be deformed during walking or action with the character, and to put more polygons into those sections. Areas that will always remain static – and especially areas that will remain straight – need far fewer polygons (Fig.18).









19. Flatten out the bottom of the foot and shape it so that it resembles the concept art provided. It's important to note the foot is basically a hoof, and is solid. There are no toe areas so the foot will not bend when walking (Fig.19).

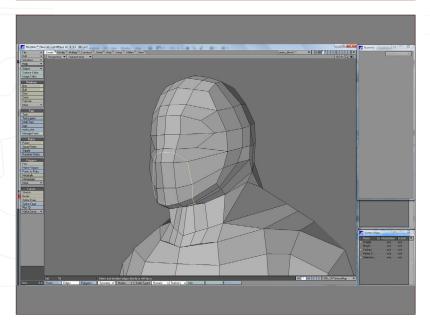


Fig 20

20. Continuing with the head, I'm going to put in edge loops that range from the bridge of the nose to the bottom of the chin. Even if it's not perfectly tidy, it's important to block out all the basic topology loops in the face so that we can later alter the shape and quickly add detail by inserting new edge loops (Fig.20).

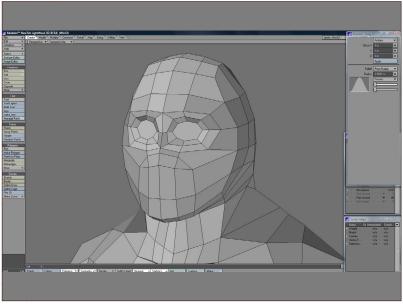


Fig 21

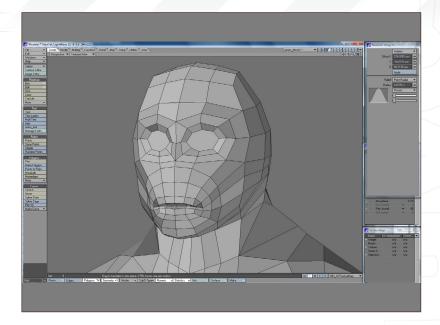
21. Now we're going to create the base for the eyes. Creating circular loops around the eyes makes it easy to add additional loops later, but also creates the most optimal topology to animate the eyes (Fig.21).



lightwave

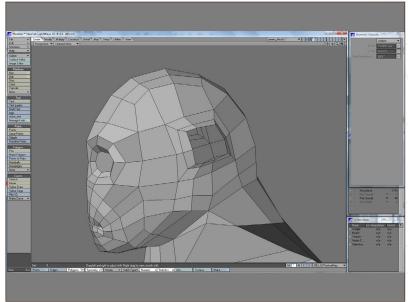
22. Like with the eyes, I'm going to create more loops inside of the mouth section. I create circular loops around the mouth, making sure to position them at key points that will affect the silhouette; for example the top of the upper lip, which in its circular form will create the bottom part of the lower lip (Fig.22).

Fig 22

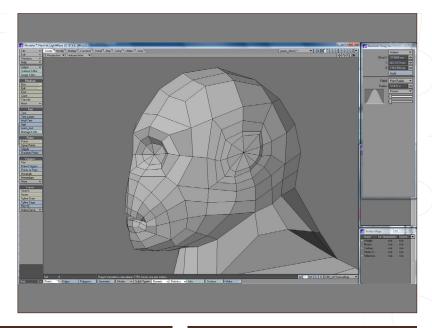


23. I'm insetting polygons on the side of the head to form the ear. We want the topology of the top and side of the head to flow into the ear naturally. To do this I simply selected the 4 polygons on the side of the head and use Smooth (Shift + F) to extrude the geometry (Fig.23).

Fig 23



24. Now I tidy up the shape of the ear and weld the points in the middle (Fig.24).







25. Continue to work on the model by tidying up all areas until you are left with mostly quads. If you do have triangles, ask yourself why they are there. They should only be there if they are performing a function, whether it is for the silhouette, polygon reduction, or to help deformation. It's good to ask yourself these questions throughout (Fig.25).

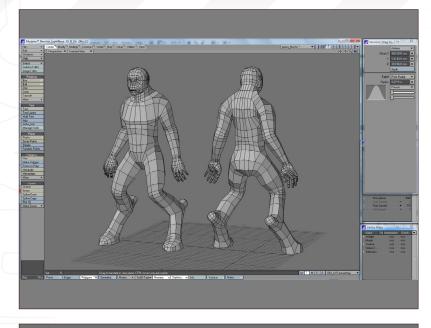


Fig 26

**26**. And here is the final silhouette (**Fig.26**). Next month we'll be sculpting the high-res model in ZBrush, and I'll be back in Part 4 of this series for more LightWave work.

# Creature Concept by RICHARD TILBURY

Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by James Busby for LightWave.

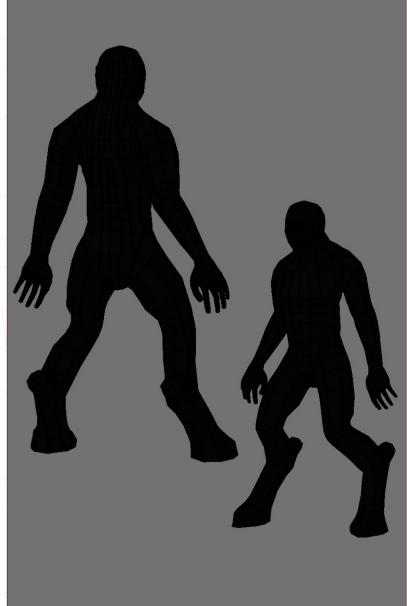
Tutorial by:

# JAMES BUSBY

For more from this artist visit:

http://www.ten24.info

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# NEXT GEN CHARACTER CREATON SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

# CHAPTER 1 – LOW POLY MODELLING

This chapter is divided into two categories, the first of which focuses on using ZBrush to create a low-poly sculpt from ZSpheres to approximate the proportions of the creature concept. The second section takes and imports this mesh into the appropriate software and explains the principles and importance of optimisation.

Chapter 2 – High-Poly Modelling Part 1 | Aug 09

CHAPTER 3 – HIGH-POLY MODELLING PART 2 | SEP 09

CHAPTER 4 - MAPPING / UNWRAPPING | OCT 09

CHAPTER 5 - NORMAL MAPPING - TEXTURING | NOV 09

Chapter 6 – Materials, Lighting & Rendering | Dec 09







# NEXT GEN CHARACTER CREATION SERIES

## PART 1A

Software Used: ZBrush

There has never been a better time to create a next-gen creature. Tools like ZBrush, Mudbox, and 3ds Max are all weapons in our arsenal, allowing us to create believable, realistic, and detailed creatures that were previously too complex to even be considered.

We will begin this tutorial series by looking at creating a base mesh for our creature, designed by Richard Tilbury at 3DTotal (Fig.00). Using a combination of ZBrush and a variety of software packages, we will create a base mesh from ZSpheres, then retopologise and perfect our mesh in 3ds Max, Maya, LightWave and

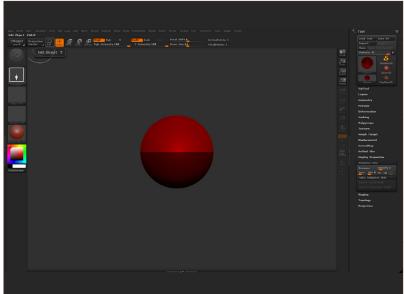
Since coming onto the market, ZBrush has revolutionised the video games industry. Detail that was previously only possible through meticulous hand painting can now be done quickly and easily because of this programme. Organic characters are now able to look just as realistic and stunning as their high-poly counterparts. ZSpheres are a wonderful way to create a quick, simple base mesh that can be retopologised (the process of creating new topology on a mesh) and refined in a general 3D application.

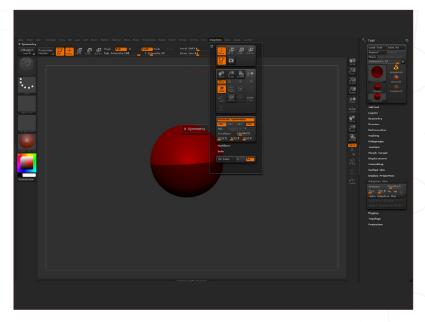
1. To create a mesh using ZSpheres, we'll first drag one out onto the canvas, and then proceed to add more ZSpheres off of the original. This will build up the character in the same way we would with bones. It's important with ZSpheres to plan out the construction of your character before you start. The original ZSphere should act as the pelvis or waist, with additional ZSpheres coming off to form the limbs and midsection.

Fig 00



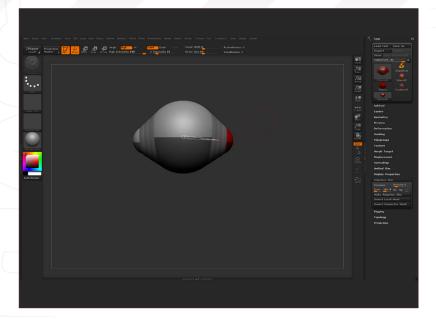
Fig 01











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Fig 03

First we click on the ZSphere icon in the tool palette, then left-click and drag to place a ZSphere onto the canvas. Release the left-click, and then hit the Edit button [Q]. Now our ZSphere is placed and editable, and we can go on to add new ZSpheres off of this original (Fig.01).

2. To save time and make our job easier we can use symmetry to automatically create the opposite side of the model as we work on only one side. To enable this in ZBrush simply press [X] or go to Tool > Symmetry > Activate Symmetry, and make sure the X button is highlighted. If you now hover over the model, you will see another cursor on the opposite side that mirrors the actions of the original cursor that we're manipulating (Fig.02).

Fig 04

- Click and drag on the right side of the ZSphere to create what will be the hip section (Fig.03).
- **4.** Create a new ZSphere off of the last one by using the same click and drag technique. This new ZSphere will act as the first knee joint (**Fig.04**).

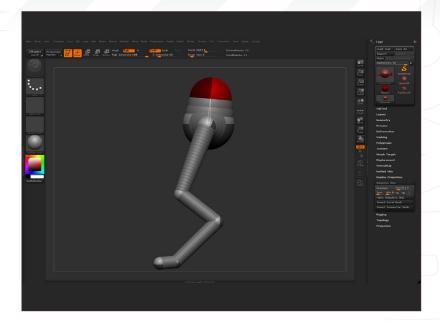
Fig 05

5. We'll now use the brush move tools to position the section we just created. At the top of the window (providing you are using the default ZBrush interface), there are buttons labelled, Edit, Draw, Move, Scale, and Rotate. Click on the Move button and right-click over the model. Make sure the draw size is small, as a large draw size acts as a soft selection and will move other parts of the model as well. Decrease the draw size to the minimum and move your mouse away from the menu. Select the ZSphere we just created and drag it downwards and into position (Fig.05).



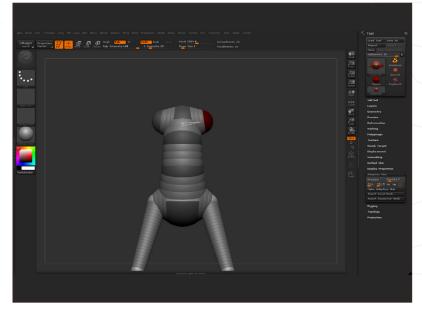
6. Now create a new ZSphere on the bottom of the knee joint, remembering to create it on the ZSphere itself and not on the intersection. Position this as shown and go on to create another two ZSpheres to act as the end of the leg and foot bones. We are going to move on to creating the mid-spinal sections and the chest. Create another three ZSpheres on top of the pelvis and position them as shown, using the Move tool as before (Fig.06).

Fig 06

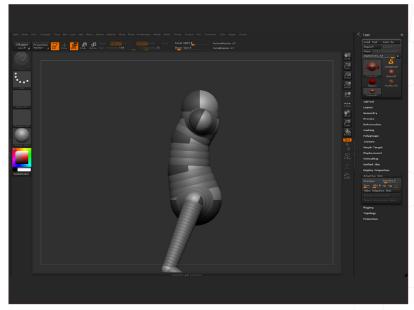


7. Create new ZSpheres on the side of the upmost ZSphere to act as the clavicle, or shoulder area. I find that creating these sections, as opposed to just using that last sphere as the elbow, gives a nicer curvature for the underarm and shoulder areas once the model is meshed (Fig.07).

Fig 07

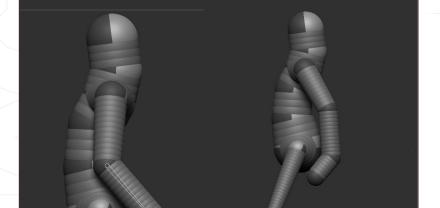


8. Now we go on to create two ZSpheres on top of the upmost middle sphere to act as the neck and head. It's important to position the head section straight up, as the topology of the top of the sphere lends itself to the top of the head, with the face being built on the front (Fig.08).









9. It's now time to create the arms, which will be built using the same methods as before. We create three sections to form the elbow, wrist,

and hand (Fig.09a & Fig.09b).

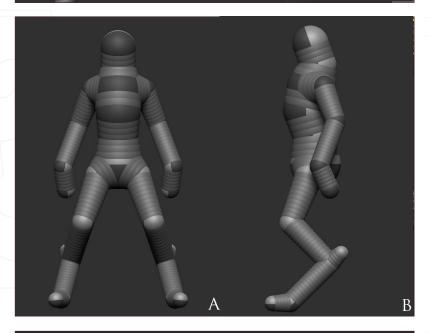


Fig 10

10. The last ZSphere to be placed is the one on the back of the lower knee joint, duplicating the bone that sticks out in the concept drawing (Fig.10a & Fig.10b). Once all of the ZSpheres are placed, we can move into the refining stage,

part of which is creating the hands.



Fig 11a

11. Surprisingly quickly, we now have the whole character built and blocked out, and it's time to go over it with a tweaking pass. Use the Scale and Move tools to try and match the concept art in proportions, pose and scale. The closer we get now, the easier the retopology work will be.

A ZSphere model is nothing until it's meshed, and that's where Adaptive Skin comes in.

Adaptive Skin is a method for creating a usable model from ZSpheres. It also comes with the handy option of previewing the model before creation. Open the Tool menu and find the Adaptive Skin palette.



Skin menu (Fig.11a) we have the:

# Part1: NEXT GEN CHARACTER CREATION SERIES

There are plenty of confusing options in the palette, so here is a quick explanation of their functions (explanations of almost any tool in ZBrush can also be found by hovering over the tool and holding down Ctrl). Under the Adaptive

- Preview button, which turns on and off our meshing. You can use the hot-key [A] to enable and disable this. It's very useful to keep checking the mesh to see how your ZSpheres are looking.
- Density, which calculates the number of subdivisions that the mesh should have. A density setting of one will be very low poly; a setting of two will be four times that, and so on.
- Ires (Intersection resolution), which is the number of consecutive ZSpheres that will be used to create a single object when the mesh is converted into polygons. This can be visualised by thinking of one sphere with a two-segment chain on either side. With an Ires of 0, each sphere will turn into individual spheres with a few joining polygons to connect them together. An Ires setting of one will turn the three middle spheres into one flowing cylindrical mesh, with the outer two spheres still maintaining their spherical shape.
- Mbr (Membrane Curvature), which adjusts
  the smoothness in the T- and L-shaped
  intersections. The higher the setting, the
  smoother the curve will be, whilst a low
  setting will maintain the shape of the right
  angle.
- MC (Minimal skin to child), which ignores
  the child\* of the section of the object,
  using it to connect two parts together but
  not contributing any polygons. This allows
  smooth transitions between new branches
  and can help eliminate twisting and
  collapsing.

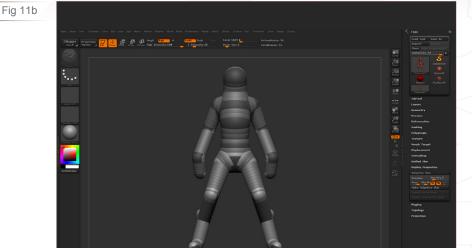


Fig 11c

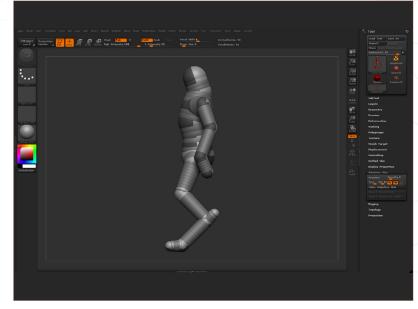
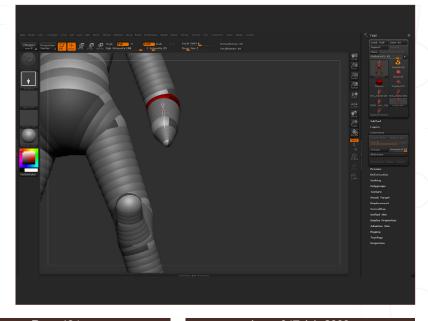
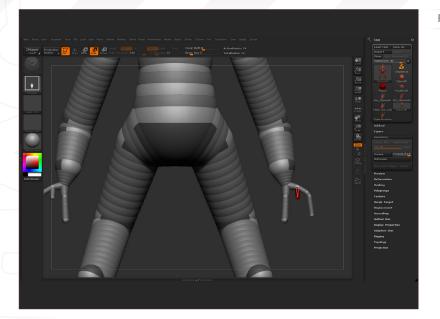


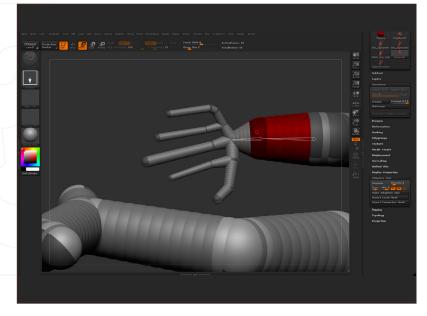
Fig 12a

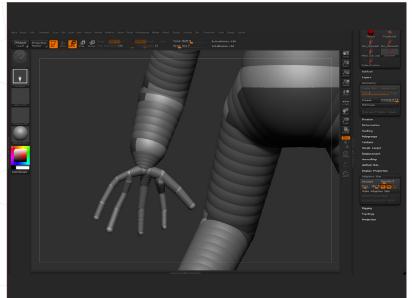


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creative

Fig 12b

Fig 12c

Fig 12d

- MP (Minimal skin to parent), which ignores the parent\*\* of the section of the object, using it to connect two parts together but not contributing any polygons. This allows smooth transitions between new branches and can help eliminate twisting and collapsing.
- PD (Pre-divide), which lets you specify a pre-division resolution to match objects which are attached using connector mesh or local mesh features.
- \* A ZSphere created off another ZSphere is known as a "child" object.
- \*\* The original ZSphere is known as the parent (think of it as a mother and daughter holding hands!)

Once you understand the features, Adaptive Skin is not too complicated, and it's a very quick way to block out a character, animal, alien - or even a car! So now that we have a good set of Adaptive Skin settings, we need to modify the mesh a little to make it optimal for animation and speed up the next optimisation section.

model, namely the shoulder, the crotch, and optionally the neck. Placing a sphere on either side of the knee and elbow joints gives us three edge loops close together – the optimal amount for bending in animation. You can add a ZSphere to an existing section by holding control and clicking on the section while in edit mode (Fig.11b - Fig.11c).

12. The next – and final – stage is to create the hand. The process is roughly the same as with the whole character but it needs to be a little more precise in the layout of the ZSpheres. We are creating mid-sections that will serve to create the palm and finger joints (Fig.12a -Fig.12d).

Place new ZSpheres at the join areas of the

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13. Follow along using the video and screenshots as references to lay down the ZSpheres. Once all are in place, it's important to check the adaptive skin [A] and adjust the hand to anatomically correct proportions as much as possible. Creating a natural, relaxed pose here will be of great benefit to us later (Fig.13).

**Free Movie:** You can download the movie here, or by clicking on the Free Movies icon at the end of the tutorial.

14. Our character base mesh is now built and ready to be exported into our 3D application. No UVs have been set up yet, as we will do that inside our 3D application later. Before we can export we must turn our preview mesh into a usable one by simply clicking the Make ... (Fig.14a).

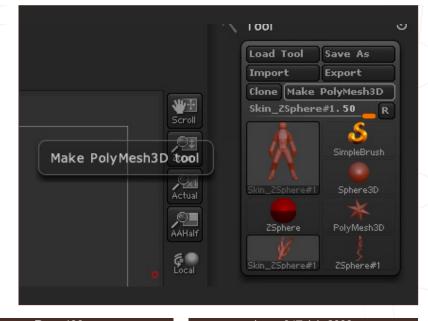
Fig 13



This just created a duplicate model, which ZBrush swapped the active tool to and began using as the primary model. This new model needs to be converted to a PolyMesh3D object which we can export. Under the Tool menu, click Make Polymesh3D (Fig.14b).

Now all that is left is to click Export (in the Tool menu), give it a name, and save into your project location ready for the next step.

Fig 14b

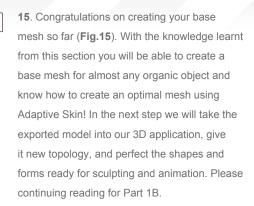


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Fig 15



# NEXT GEN CHARACTER CREATION

Creature Concept by RICHARD TILBURY

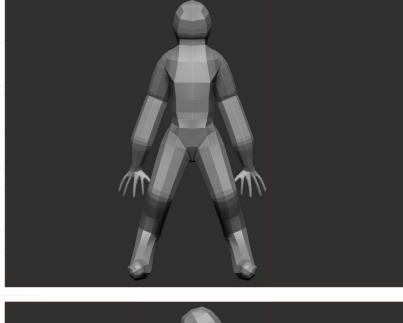
# Tutorial by: JOSEPH HARFORD

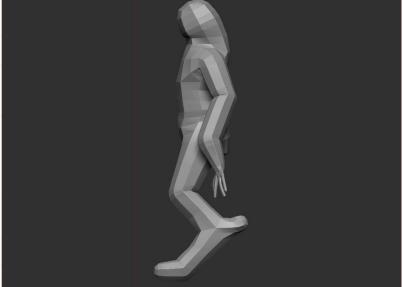
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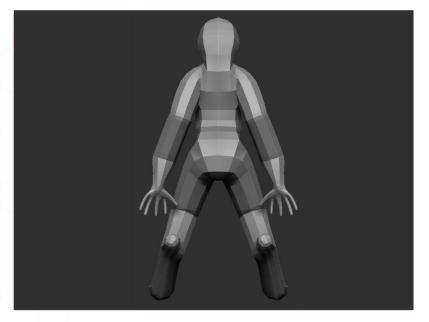
http://josephharford.com/

Or contact them:

Josephharford@googlemail.com













# CHARACTER CREATION SERIES

## PART 1B

Software Used: Maya

Optimisation and topology are vitally important in real-time character creation. Whether it's for video games, the web, or interactive media, polygon count and topology should be high on your priority list. If you have a budget of 10,000 tris for a character (most game studios work with tri count as opposed to poly count), plus clothes and accessories, there are a number of considerations to decide on while building. Things like: How am I going to spend those tris wisely? Which areas should have the most tris? How can I go about creating animation-friendly topology with as few tris as possible and how can I keep the silhouette as smooth and edgefree as possible with the minimum amount of tris? These questions are vital, and should be asked all throughout the process of modelling a character. They should be considered at each stage and should be present in all your decisions during this part.

I am using Maya 2008, but the principles of this tutorial will be relevant in all versions of this software. As I use Maya more at work than at home, a lot of the commands I mention in the tutorial can be accessed through Maya's Hotbox, which can be accessed by holding down the spacebar to access all of the menus at the top of your screen. Like many features in Maya, it's essentially a duplicate of something else somewhere else in the programme, but many advanced users rely on it for speed.

1. We will begin by importing our model into Maya, making sure that .OBJ is enabled in Window > Settings > Preferences > Plug-In Manager. Select the model that we created in Part 1A (Fig.01).

Fig 01

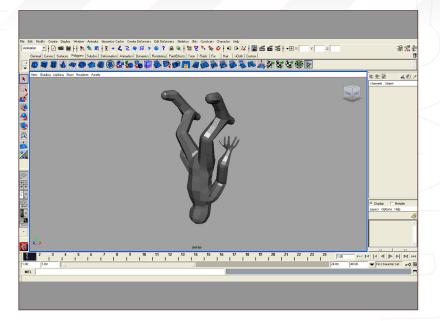
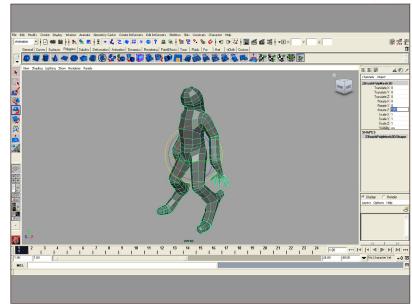
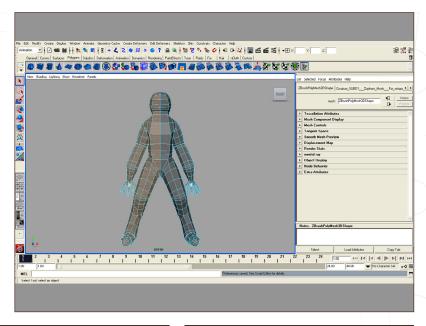
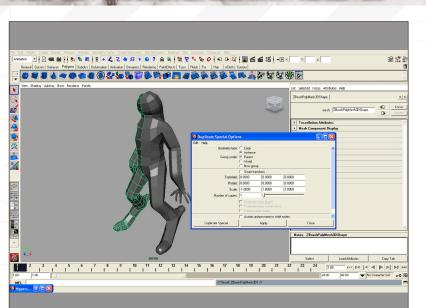


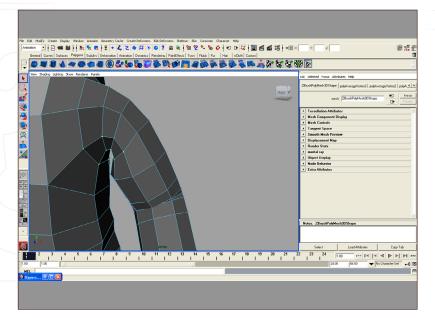
Fig 02

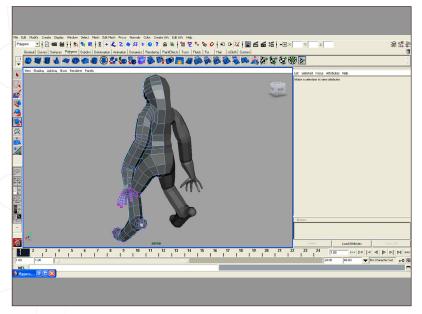












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Fig 04

- 2. When we import the model into Maya using the default options, it is clearly flipped upside down. To make this model easier to work with, and more relevant to Maya's world coordinates, select the model and enter Rotate mode. On the right hand side of your screen will be the channel box. Enter "180.00" into the Z rotation value (Fig.02).
- 3. Next, select the model, clear all of the history (Edit > Delete by Type > History) and Freeze/
  Reset the model's transformations, which can be found in the modify menu. The reason why I always do this is to keep the model (and scene) as clean as possible. Having information such as rotation values in the model's history stack can cause problems later on and can make the scene bloated and hard to manage. That being said, Maya's history is a nice way to enable/ disable actions on your model, and once the model's history is cleared all changes made to your model are final. So, be sure to have your model in a state you are happy with before clearing the history!

Unlike traditional sculpting mediums, we are able to work in symmetry within Maya. With one side automatically updating in reference to the other, this enables 3D artists to work much more quickly during the modelling process. To work with symmetry on this model, select half of the faces. In this case I am using the Y/Z axis as a mirroring edge, so I have selected all of the faces on the –X side of the Y axis. With the left half of your model selected, delete the faces (Fig.03).

4. Now, select the model and click Edit >
Duplicate Special Options, enable Instance
rather than Copy, and then enter -1.0 as the
value for Scale on the X axis. This will duplicate
our current model and still reference the new
copy to our original model. Entering -1.0 as
the scale value on the X axis will mirror our
model on this axis. Once we are done with
the modelling stage, we will combine these
two models into one single mesh and weld the
vertices on our seam together (Fig.04).

Fig 06



- 5. We can now move onto cleaning our model and making it a useful base for sculpting. Glancing at the mesh we can begin to spot problem areas. Issues to watch out for are overlapping edges, twisted faces and uneven polygon distribution. We'll start with the area underneath the arms. Select all of the vertices in the arm pit area, select Mesh > Average Vertices Options, and reduce the Smoothing Amount option that appears. With the vertices selected and with your smoothing amount entered, press Apply. You may need to shrink your selection, focusing on a smaller amount of vertices to really smooth out troubled areas that are pinching too strongly. Shrink your selection by pressing SHIFT + <. This will attempt to even out the spacing between vertices and will help us in eliminating overlapping edges. As you can see, the result is a bit too extreme, so after selecting Average Vertices we will need to
- **6**. Like in step 5, we will repeat the process of relaxing vertices in problem areas and quickly touching up the geometry to have smooth transitions in joints with minimal overlapping of edges. Areas that will need this attention are the knees, elbows, hands and feet (**Fig.06**).

manually move a few of the vertices around to

eliminate any protruding (Fig.05).

7. We will now begin adding edges to our model. A nice, clean mesh with evenly distributed polygons is essential to create a problem free base mesh. In regards to sculpting packages, squares do not subdivide the same way as rectangles. By this I mean if you have one mesh that has a square polygon and beside it is a long rectangle, and you divide this mesh twice, the newly created polygons will retain the original shape. When sculpting this will create nice, smooth results on the area from the square polygon, but slightly muddy details on the rectangular area as there will be less geometry for you to work with. So, you will end up subdividing this mesh more times than necessary to get satisfactory results. To avoid this problem try to make the density of polygons within your model as even as possible.

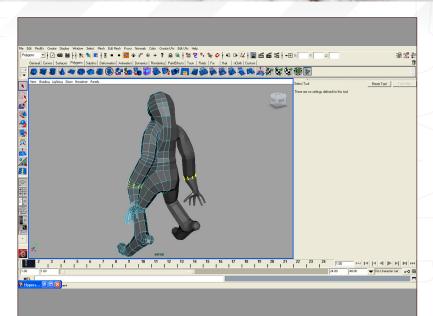
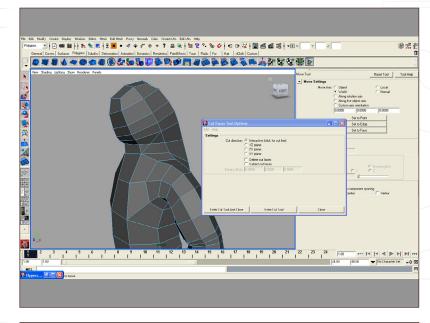
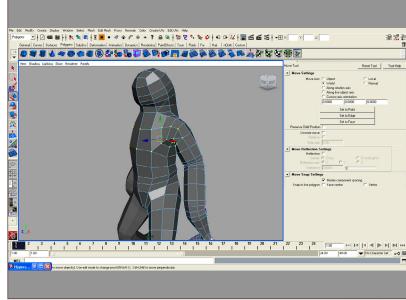


Fig 08

Fig 07









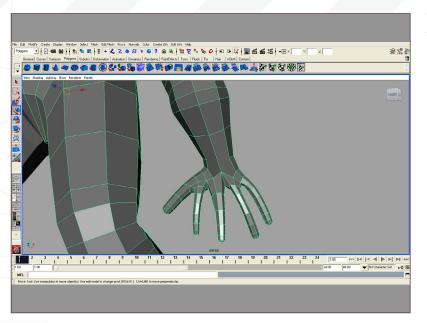


Fig 10

I start by adding an edge running down the character's back and to the base of the skull. I am adding edges by using the Split Polygon tool. In Object Model, you can press Shift + RMB (Right Mouse Button – or right-click) to access the Split Polygon Tool, and then continue to select the areas of an edge that you would like to add a vertex to (Fig.07).

8. Next, I create an edge to define the sternomastoid muscle. This will begin the topology flow that I want in this area. For the moment, keeping the model fully in quads isn't a high priority as triangles can be converted in the

final steps of modelling (Fig.08).

Fig 11a

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9. Next, alter the edges in the chest area to define what will be the underside of the chest and shoulder muscles. I often model using this method, defining the chest and shoulders with these edges as when deformation time comes; having the chest and shoulders connected in this way allows the muscles to retain shape when moving, especially in extreme poses like when the characters arms are raised (Fig.09).

Fig 11b

**10**. As you can see, the topology of the wrists and hands could use some improvement. The wrist will not animate well this way, nor are the fingers in a state to be sculpted or animated. We begin by removing a few edges on the top of the hand (Edit Mesh > Delete Edge/Vertex) (Fig.10).

金式子 

11. Continuing forward, we begin to work on the underside of the hand, defining the two major padded sections of the palm. It is important to note the flow of edges around the thumb in this area as the thumb will need to pivot and deform in the future. We do this following the same methods as before, deleting edges/vertices and using split polygon to add edges that we need (Fig.11a & Fig.11b).



12. The topology of the hand should flow from the fingers, much like how the bones in our hands do. Reduce the edge loops around the fingers, using the techniques from previous steps; adjust the joints and a connector loop near the knuckle. Now is also a good time to clean up the surrounding area, attempting to make the entire hand quads (4-sided polygons) and avoiding poles in areas that will need to deform (a pole is where more than 4 edges connected to a vertex; having too many edges meet at a vertex can cause pinching, shading errors in-game, and can also be a pain to rig). Another issue regarding triangles is that they do not smooth well, or at least not as well as quads do. For real-time models, creating triangles can be an effective way to define areas while still

keeping a poly count within budget (Fig.12).

13. Next, we create points on each knuckle and allow the hand to flow into the wrist without drastically changing the poly count. Hands are notoriously difficult to model as they can bend and move into a number of awkward positions. There are many subtle details to the hand, as on any creature, which makes it one of the most difficult areas to develop in character creation. As people are so aware subconsciously of the anatomy of hands, as we are of faces, it becomes easy for observers to spot mistakes automatically. Unfortunately, without repeated study we don't have enough information in our heads to fix those mistakes by eye. For that reason I advocate dedicating a portion of your time to studying the anatomy of the hand, the muscles and bones that drive it, and how they interact with each other. After a number of drawings and sculptures the information is burned into your brain for use in the future. The more information we store, the more we can recall at a later date, allowing us to work more creatively, efficiently and with more confidence (Fig.13a & Fig.13b).

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Fig 13a

Fig 12

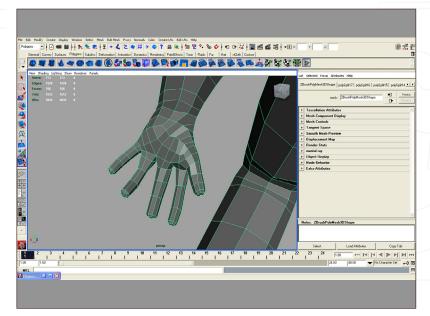


Fig 13b

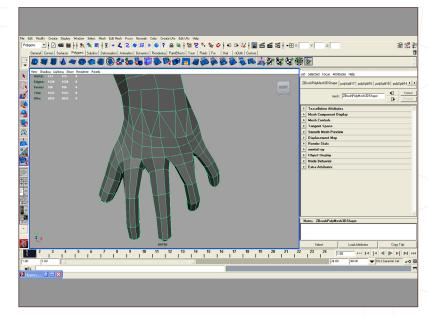
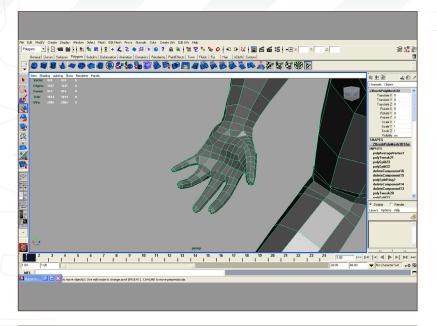






Fig 14a

14. Now we continue on with the hand, further working the thumb and palm area and adjusting proportions even more to match a more "humanoid" appearance. Key parts to take note of are lengthening the palm, adjusting the fingers and generally cleaning the topology of the model. I also added some volume to the fingers and apply Average Vertices at a very low strength. Since this mesh will later be used in ZBrush, as I mentioned earlier, it is important to keep the polygons roughly the same size and to make sure that the polygon density throughout your model is fairly consistent (Fig.14a & Fig.14b).



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Fig 14b

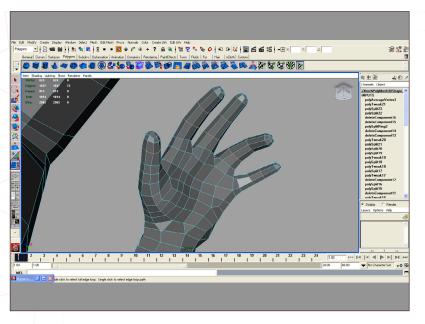


Fig 15a

15. We are now going to give the knuckles more definition. Select the edge loops that are in the rough area of the character's knuckles on all fingers and thumb – I use the Select Edge Loop feature within Maya by entering edge mode, holding Ctrl and pressing RMB - and then select Edge Loop Utilities > Select Edge Loop. By holding down Shift and clicking on multiple edges, you can retain your previous edge loops selected. Once all of your edges are selected, select Bevel Options from the Edit Mesh menu. In the dialogue box that appears, I enter a low value for the width of my bevel (the amount of space that will be created between the extreme edges) and enter 2 for my amount of segments, or edges that would be created. By default,



Maya needs to have 1 entered; by entering 2 we are just adding an edge in the middle of the bevelled edge that we have created (Fig.15a & Fig.15b).

Fig 15b

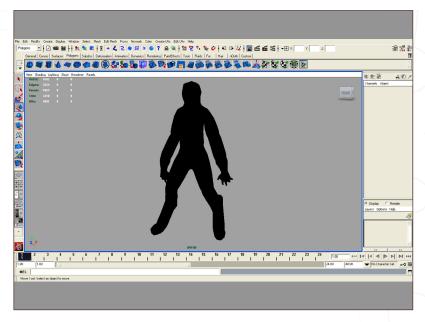
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16. Next, we move back to the head and we begin by blocking out the eyes. The eyes are the most important landmark on a characters face. It makes a character instantly recognisable to our mind as being "believable" and is also a solid way of predicting where the rest of the facial features will go (Fig.16).

Fig 16

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17. I apply a new material to the object to see how it looks in a silhouette form. During the whole process of building the model we should be looking out to make sure the silhouette looks interesting, proportionally correct, and as close to the concept as possible. Having no lighting information applied to your model allows you to see your model in a totally different way; shadows being cast and highlights on your model can distract from how your model actually reads from afar in its most simple form. To create a new material, I open the Hypershade menu (Window > Rendering Editors > Hypershade), click on Surface Shader and with the model selected, right-click over the Surface Shader ball in Hypershade, and then select Apply Material to Selection (Fig.17).





#### NEXT GEN CHARACTER CREATION SERIES Part1:



Fig 18

18. Glancing at the model in this form we can see that the legs are going to need some work before we move forward. Let's start by simplifying the second knee and how it protrudes from the leg. Remove a few of the edges to simplify the area (doing the same to the foot as well). It is important to consider how this character will move. Areas that will need to deform should have more geometry to avoid stretching or having a "rubber limb", collapsing effect. Areas that will remain static have no twisting effect or will not have muscle definition reacting to joint movement can have much less geometry devoted to them (Fig.18).

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Fig 19

19. Now, flatten the bottom of the foot and shape it to roughly match the concept art provided. This character's foot is actually a hoof, and because of this we do not need toes and therefore deformation in this area is fairly limited. Considering this, we can collapse some edges on the topside of the foot to simplify the area (Fig.19).

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Fig 20

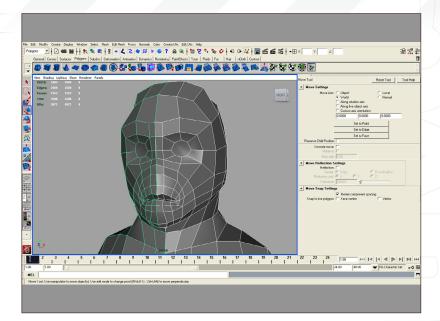
20. Moving back to the head, we'll place edges that reach from the bridge of the nose to the base of the chin. At this stage we are practically just setting up landmarks on the face that we will later refine and polish in future steps (Fig.20).



21. We will now further define the eye region that we marked in previous steps. Creating circular loops to define the eye sockets allows us to add edge loops much easier later on, if needed, and also creates the ideal topology for animation in this area. To do this, I select the vertex that would mark the centre of the eye, select Edit Mesh > Chamfer Vertex (Options) and enter a value of 0.5 in the dialogue box that appears. Once this is done, I add edges using the Split Polygon tool and manually tweak some vertices to give the eyes a rounder shape

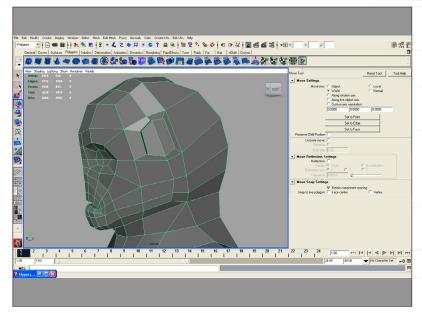
(Fig.21).

Fig 21

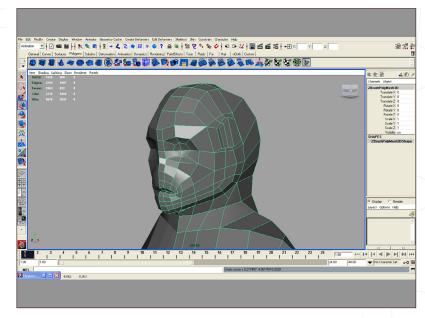


22. Fill in the eye polygons with the Split Polygon tool to leave it in quad polygons. Once this is done, we move onto the ear area. Using the same methods noted in previous steps, we will add geometry to this area to help mark and define the ears and how they are connected to the head. We want the topology of the top and side of the head to flow naturally into the ear. Ears are a trouble area in characters with regards to shading as too many edges connecting into one vertex and with geometry protruding out of faces, and in this case can cause shading errors in real-time engines. So, be sure to keep this area as clean as possible (Fig.22).

Fig 22



23. Continue to add edges in the jaw/chin area, making sure that they flow smoothly into the ear. As the nose does not actually protrude from this character, we will not add geometry for it in our base mesh. When creating a base mesh, the only details that are needed are the large volume shapes in your character – other details can be added quicker and more efficiently in a sculpting package (Fig.23).





### NEXT GEN CHARACTER CREATION SERIES Part1:



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Fig 24

24. It is easy to focus too much on one specific area of a model, for example I often view my character from a three-quarter view and tend to neglect the front view. That being said now is a great time to check the proportions and silhouette of our model and move onto an area that we have neglected so far, and the last formal stage of modelling in this section of the tutorial: the back. Straighten out edges where you can, touch up the base of the skull, possibly adding edges to make the area as clean as possible (Fig.24).

| Color | No. | No. | Color | Vision | Reside | Groundy Caller | Color | Color

Fig 25

Fig 26

25. When exporting an object for sculpting or for use in a game engine, it is important to be aware of soft and hard edges. Defining soft and hard edges does not create more polygons on the object, but it does, however, affect how engines render the object. Essentially, if a hard edge is defined, double the amount of rays will be shot out of the vertices connected to the edge to define how the object will be shaded. Sometimes they are necessary to define hard surfaces, for organic characters it is rare to have any. Just to be sure and to avoid any complications when exporting, select all of the edges on your character, hold Shift + RMB and select Soften/Harden Edges, finally clicking Soften Edge. You notice a visual difference on your model as all of the hard edges that would have been created in the modelling process are no longer there ... and by using this tool, all of your edges will now appear orange until you switch tools. Generally speaking, for characters you will avoid having hard edges in a next generation engine as the hard edge shading can contradict lighting information applied by normal maps (Fig.25).

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26. Using the methods outlined in this section, continue to plug away at your model and tidy up any areas that may cause problems down the line. If you do have triangles in your model, ask yourself what their function is. If they are serving no purpose, try your best to turn them into quads cleanly (Fig.26).

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Fig 27a

27. Once you are happy with your model, select both halves and then under the Mesh menu, select Combine. This essentially turns your model into one piece. With your model selected, delete its history. Select the centre edge loop of the model, hold Ctrl + RMB and select To Vertices. This will convert your selection to the connecting vertices. Under Edit Mesh, select Merge (Options) and enter an appropriate value - mine was about 1.3. Once this is done you will notice that there is an obvious seam still running down the centre of your mesh; this is a hard edge causing by combining the two meshes, as mentioned earlier. Once again, select all of the edges and convert them to soft edges. At this stage I also like to select all of my edges and use the Average Vertices tool again. I find that this helps smooth out any trouble areas and will help avoid a "boxy" model once it smooths in

For the final section of this part, I've used a combination of moving vertices using soft selection and hand pulling the model around to work further on matching the pose and proportions of the concept. What we have at the end is a base mesh that will not only work well for sculpting our high poly, but also animate well, run efficiently in our real-time engine, and look good from all distances due to our care and attention to the silhouette (Fig.28).

ZBrush (Fig.27a & Fig.27b).

Next month in Part 2 we'll be sculpting the real meat of the character, muscles, veins and all!

Creature Concept by

#### RICHARD TILBURY

Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by Gavin Goulden for Maya

Tutorial by:

#### **GAVIN GOULDEN**

For more from this artist visit:

http://www.gavimage.com

Or contact them:

gavin@gavimage.com

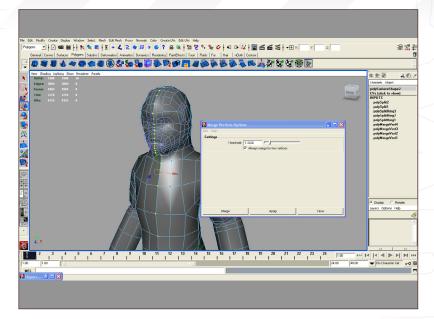
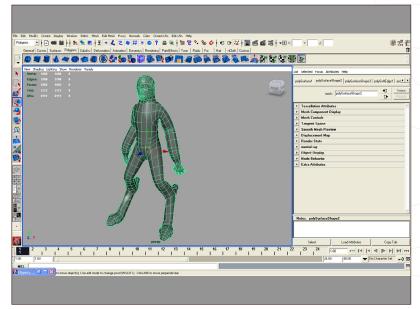
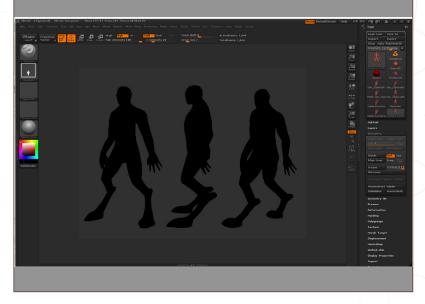


Fig 27b







# NEXT GEN CHARACTER CREATON SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

#### CHAPTER 1 – LOW POLY MODELLING

This chapter is divided into two categories, the first of which focuses on using ZBrush to create a low-poly sculpt from ZSpheres to approximate the proportions of the creature concept. The second section takes and imports this mesh into the appropriate software and explains the principles and importance of optimisation.

Chapter 2 – High-Poly Modelling Part 1 | Aug 09

CHAPTER 3 – HIGH-POLY MODELLING PART 2 | SEP 09

CHAPTER 4 - MAPPING / UNWRAPPING | OCT 09

CHAPTER 5 - NORMAL MAPPING - TEXTURING | NOV 09

Chapter 6 – Materials, Lighting & Rendering | Dec 09





# NEXT GEN CHARACTER CREATION SERIES

PART 1A

Software Used: ZBrush

There has never been a better time to create a next-gen creature. Tools like ZBrush, Mudbox, and 3ds Max are all weapons in our arsenal, allowing us to create believable, realistic, and detailed creatures that were previously too complex to even be considered.

We will begin this tutorial series by looking at creating a base mesh for our creature, designed by Richard Tilbury at 3DTotal (Fig.00). Using a combination of ZBrush and a variety of software packages, we will create a base mesh from ZSpheres, then retopologise and perfect our mesh in 3ds Max, Maya, LightWave and mode

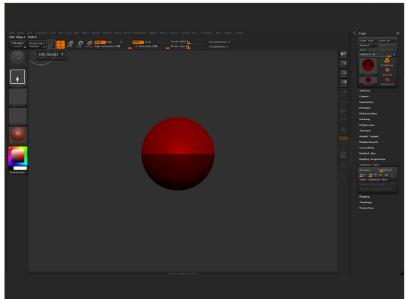
Since coming onto the market, ZBrush has revolutionised the video games industry. Detail that was previously only possible through meticulous hand painting can now be done quickly and easily because of this programme. Organic characters are now able to look just as realistic and stunning as their high-poly counterparts. ZSpheres are a wonderful way to create a quick, simple base mesh that can be retopologised (the process of creating new topology on a mesh) and refined in a general 3D application.

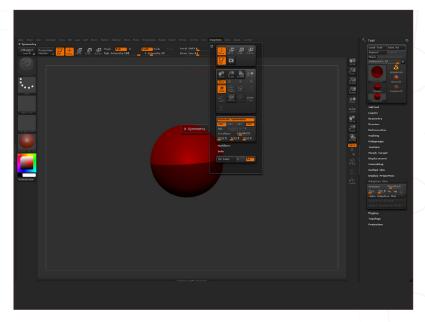
1. To create a mesh using ZSpheres, we'll first drag one out onto the canvas, and then proceed to add more ZSpheres off of the original. This will build up the character in the same way we would with bones. It's important with ZSpheres to plan out the construction of your character before you start. The original ZSphere should act as the pelvis or waist, with additional ZSpheres coming off to form the limbs and midsection.

Fig 00

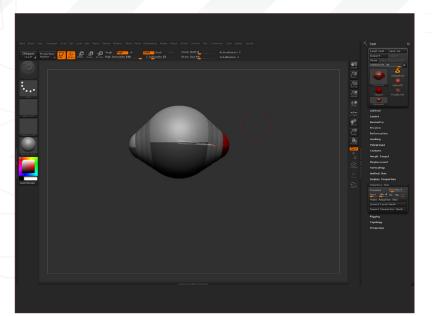


Fig 01









Total Mark 1. See 1. Source 1. Note 1. See 1

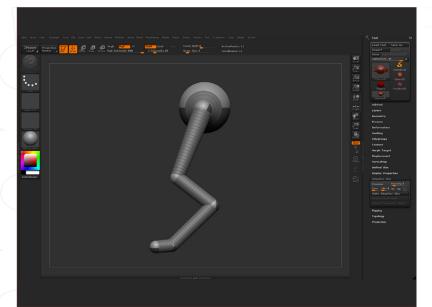


Fig 03

First we click on the ZSphere icon in the tool palette, then left-click and drag to place a ZSphere onto the canvas. Release the left-click, and then hit the Edit button [Q]. Now our ZSphere is placed and editable, and we can go on to add new ZSpheres off of this original (Fig.01).

2. To save time and make our job easier we can use symmetry to automatically create the opposite side of the model as we work on only one side. To enable this in ZBrush simply press [X] or go to Tool > Symmetry > Activate Symmetry, and make sure the X button is highlighted. If you now hover over the model, you will see another cursor on the opposite side that mirrors the actions of the original cursor that we're manipulating (Fig.02).

Fig 04

- Click and drag on the right side of the ZSphere to create what will be the hip section (Fig.03).
- **4.** Create a new ZSphere off of the last one by using the same click and drag technique. This new ZSphere will act as the first knee joint (**Fig.04**).

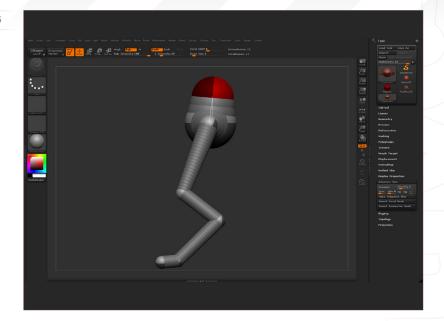
Fig 05

5. We'll now use the brush move tools to position the section we just created. At the top of the window (providing you are using the default ZBrush interface), there are buttons labelled, Edit, Draw, Move, Scale, and Rotate. Click on the Move button and right-click over the model. Make sure the draw size is small, as a large draw size acts as a soft selection and will move other parts of the model as well. Decrease the draw size to the minimum and move your mouse away from the menu. Select the ZSphere we just created and drag it downwards and into position (Fig.05).



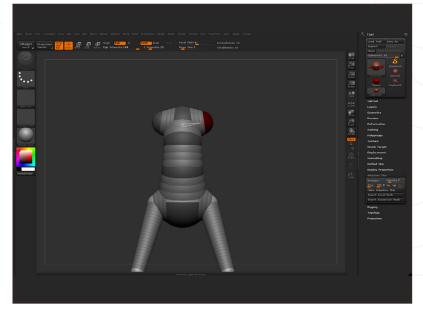
6. Now create a new ZSphere on the bottom of the knee joint, remembering to create it on the ZSphere itself and not on the intersection. Position this as shown and go on to create another two ZSpheres to act as the end of the leg and foot bones. We are going to move on to creating the mid-spinal sections and the chest. Create another three ZSpheres on top of the pelvis and position them as shown, using the Move tool as before (Fig.06).

Fig 06

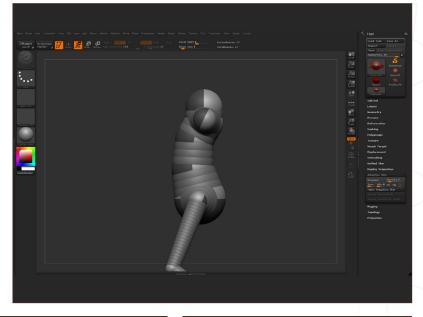


7. Create new ZSpheres on the side of the upmost ZSphere to act as the clavicle, or shoulder area. I find that creating these sections, as opposed to just using that last sphere as the elbow, gives a nicer curvature for the underarm and shoulder areas once the model is meshed (Fig.07).

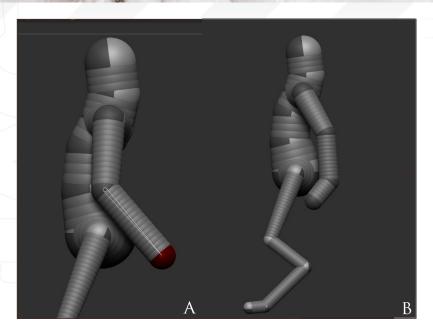
Fig 07



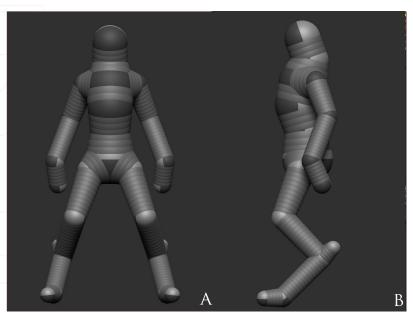
8. Now we go on to create two ZSpheres on top of the upmost middle sphere to act as the neck and head. It's important to position the head section straight up, as the topology of the top of the sphere lends itself to the top of the head, with the face being built on the front (Fig.08).







9. It's now time to create the arms, which will be built using the same methods as before. We create three sections to form the elbow, wrist, and hand (Fig.09a & Fig.09b).



10. The last ZSphere to be placed is the one on the back of the lower knee joint, duplicating the bone that sticks out in the concept drawing (Fig.10a & Fig.10b). Once all of the ZSpheres are placed, we can move into the refining stage, part of which is creating the hands.

Fig 10

Fig 11a



11. Surprisingly quickly, we now have the whole character built and blocked out, and it's time to go over it with a tweaking pass. Use the Scale and Move tools to try and match the concept art in proportions, pose and scale. The closer we get now, the easier the retopology work will be.

A ZSphere model is nothing until it's meshed, and that's where Adaptive Skin comes in.

Adaptive Skin is a method for creating a usable model from ZSpheres. It also comes with the handy option of previewing the model before creation. Open the Tool menu and find the Adaptive Skin palette.

There are plenty of confusing options in the palette, so here is a quick explanation of their functions (explanations of almost any tool in ZBrush can also be found by hovering over the tool and holding down Ctrl). Under the Adaptive Skin menu (Fig.11a) we have the:

- Preview button, which turns on and off our meshing. You can use the hot-key [A] to enable and disable this. It's very useful to keep checking the mesh to see how your ZSpheres are looking.
- Density, which calculates the number of subdivisions that the mesh should have. A density setting of one will be very low poly; a setting of two will be four times that, and so on.
- Ires (Intersection resolution), which is the number of consecutive ZSpheres that will be used to create a single object when the mesh is converted into polygons. This can be visualised by thinking of one sphere with a two-segment chain on either side. With an Ires of 0, each sphere will turn into individual spheres with a few joining polygons to connect them together. An Ires setting of one will turn the three middle spheres into one flowing cylindrical mesh, with the outer two spheres still maintaining their spherical shape.
- Mbr (Membrane Curvature), which adjusts
  the smoothness in the T- and L-shaped
  intersections. The higher the setting, the
  smoother the curve will be, whilst a low
  setting will maintain the shape of the right
  angle.
- MC (Minimal skin to child), which ignores
  the child\* of the section of the object,
  using it to connect two parts together but
  not contributing any polygons. This allows
  smooth transitions between new branches
  and can help eliminate twisting and
  collapsing.

Fig 11b

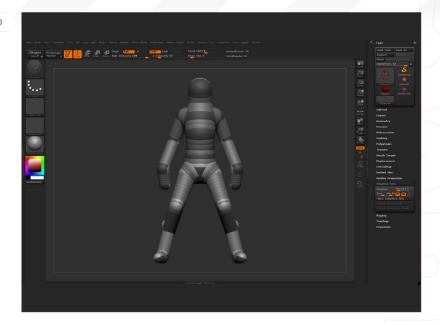


Fig 11c

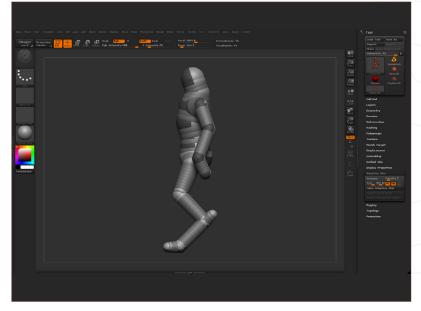


Fig 12a

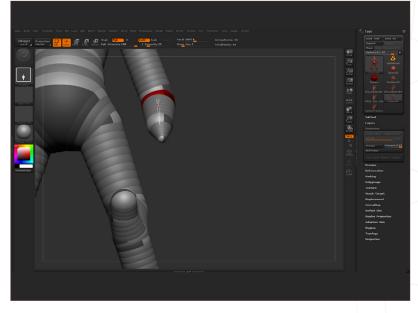




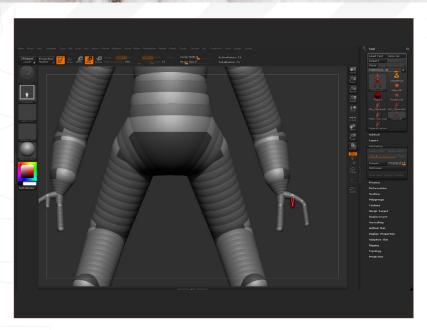
Fig 12b

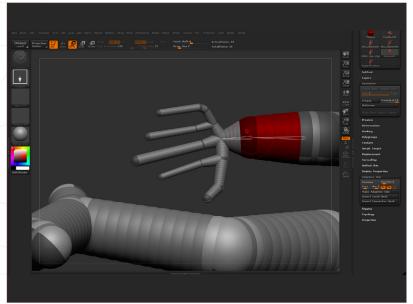
- MP (Minimal skin to parent), which ignores
  the parent\*\* of the section of the object,
  using it to connect two parts together but
  not contributing any polygons. This allows
  smooth transitions between new branches
  and can help eliminate twisting and
  collapsing.
- PD (Pre-divide), which lets you specify a pre-division resolution to match objects which are attached using connector mesh or local mesh features.
- \* A ZSphere created off another ZSphere is known as a "child" object.
- \*\* The original ZSphere is known as the parent (think of it as a mother and daughter holding hands!)

Once you understand the features, Adaptive Skin is not too complicated, and it's a very quick way to block out a character, animal, alien – or even a car! So now that we have a good set of Adaptive Skin settings, we need to modify the mesh a little to make it optimal for animation and speed up the next optimisation section.

Place new ZSpheres at the join areas of the model, namely the shoulder, the crotch, and optionally the neck. Placing a sphere on either side of the knee and elbow joints gives us three edge loops close together – the optimal amount for bending in animation. You can add a ZSphere to an existing section by holding control and clicking on the section while in edit mode (Fig.11b – Fig.11c).

12. The next – and final – stage is to create the hand. The process is roughly the same as with the whole character but it needs to be a little more precise in the layout of the ZSpheres. We are creating mid-sections that will serve to create the palm and finger joints (Fig.12a – Fig.12d).





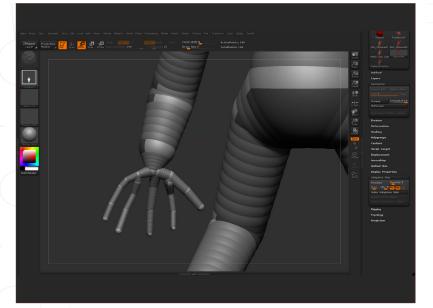


Fig 12d

Fig 12c



13. Follow along using the video and screenshots as references to lay down the ZSpheres. Once all are in place, it's important to check the adaptive skin [A] and adjust the hand to anatomically correct proportions as much as possible. Creating a natural, relaxed pose here will be of great benefit to us later (Fig.13).

Free Movie: You can download the movie here. or by clicking on the Free Movies icon at the end of the tutorial.

14. Our character base mesh is now built and ready to be exported into our 3D application. No UVs have been set up yet, as we will do that inside our 3D application later. Before we

can export we must turn our preview mesh into a usable one by simply clicking the Make ...

(Fig.14a).

This just created a duplicate model, which ZBrush swapped the active tool to and began using as the primary model. This new model needs to be converted to a PolyMesh3D object which we can export. Under the Tool menu, click Make Polymesh3D (Fig.14b).

Now all that is left is to click Export (in the Tool menu), give it a name, and save into your project location ready for the next step.

Fig 13

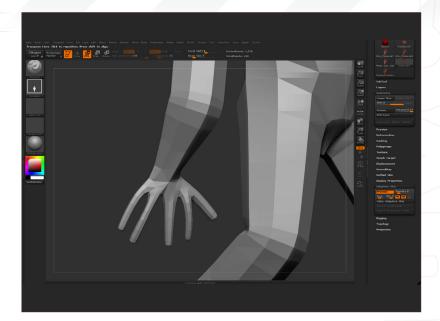


Fig 14a



Fig 14b



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Fig 15

15. Congratulations on creating your base mesh so far (Fig.15). With the knowledge learnt from this section you will be able to create a base mesh for almost any organic object and know how to create an optimal mesh using Adaptive Skin! In the next step we will take the exported model into our 3D application, give it new topology, and perfect the shapes and forms ready for sculpting and animation. Please continuing reading for Part 1B.

#### NEXT GEN CHARACTER CREATION

Creature Concept by RICHARD TILBURY

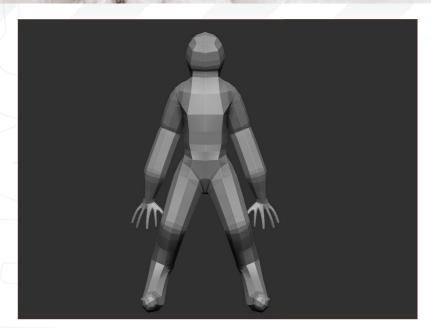
# Tutorial by: JOSEPH HARFORD

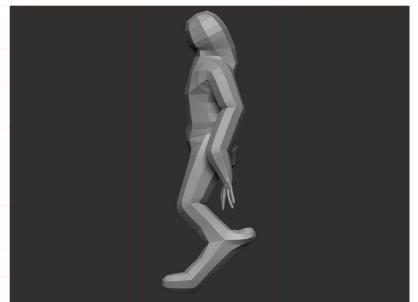
For more from this artist visit:

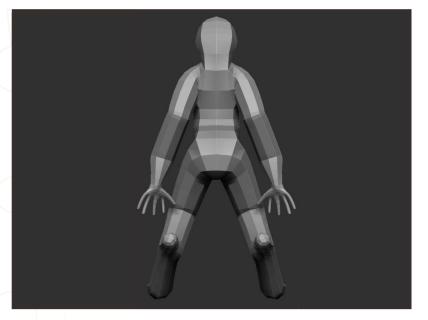
http://josephharford.com/

Or contact them:

Josephharford@googlemail.com











# NEXT GEN CHARACTER CREATION SERIES

#### PART 1B

Software Used: modo

Optimisation and topology are vitally important in real-time character creation. Whether it's for video games, the web, or interactive media, polygon count and topology should be high on your priority list. If you have a budget of 10,000 tris for a character (most game studios work with tri count as opposed to poly count), plus clothes and accessories, there are a number of considerations to decide on while building. Things like: How am I going to spend those tris wisely? Which areas should have the most tris? How can I go about creating animation-friendly topology with as few tris as possible and how can I keep the silhouette as smooth and edgefree as possible with the minimum amount of tris? These questions are vital, and should be asked all throughout the process of modelling a character. They should be considered at each stage and should be present in all your decisions during this part.

- 1. We'll start by importing the ZBrush Polymesh into Modo. File > Open... Make sure All Formats is active in the option box and select the OBJ file that was created in Part 1A (Fig.01).
- 2. When you import an OBJ model made with the default ZBrush options, the model will be flipped 180 degrees upside down. So in ether Vertices, Edges, or Polygons Mode, use the Rotate tool (E key), to rotate the model 180 degrees on the Z axis (I prefer to use Polygons Mode most of the time). To be precise, you can enter 180 degrees in the Z Rotation Offset input boxes at the bottom left panel; this will rotate to the correct orientation. The model should now be facing towards positive Z, and the head is in the Positive Y direction (Fig.02a).

Fig 01

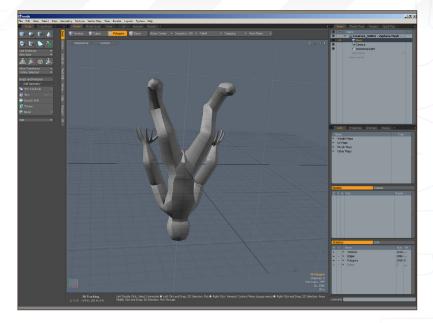


Fig 02a

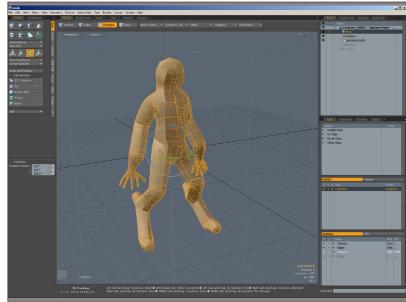
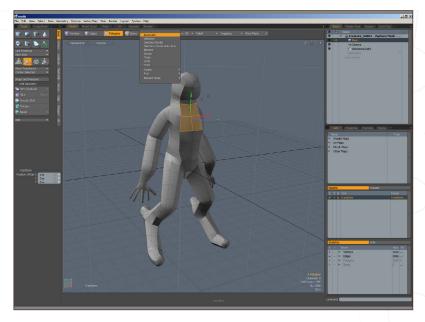


Fig 02b



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Fig 03

Note: Action Center is one of the most powerful and misunderstood features of modo. Most applications, such as Maya and 3ds Max, have only two variations on space axis: World and Local. Action Center offers far more than that, and combined with all the tools in modo greatly extends their power and flexibility. For simplicity of this section of the tutorial, keep the Action Center on Automatic without a check mark. The manipulator will then always keep world axis orientation and centre itself on your selection, just like the many other 3D applications such as Maya and 3ds Max do (Fig.02b).

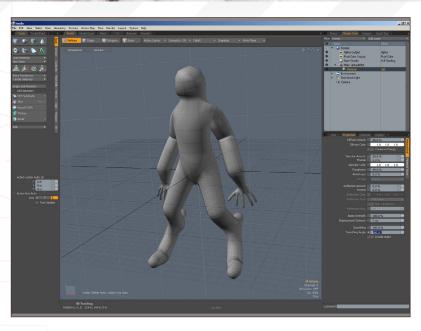
3. As the image shows, the newly imported model has some edges that are not smoothing in the same way as the rest of the model. The reason for this is because the Default Smoothing Angle is set to 40 degrees. Smoothing is an important part of real-time modelling as it can smooth the surface edges of connected polygons without having to using more polygons. As this is only a lighting effect and does not alter the polygon count or the actual model, it is simply an illusion. The Smoothing angle can be adjusted in the Shader Tree Material Properties for the selected mesh. Adjusting the Smoothing angle to 180 degrees to display the model, without hard edges, is helpful for viewing the surface to locate problem areas

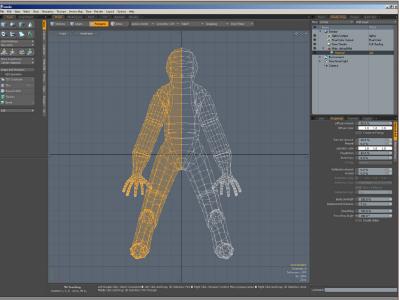
Fig 05

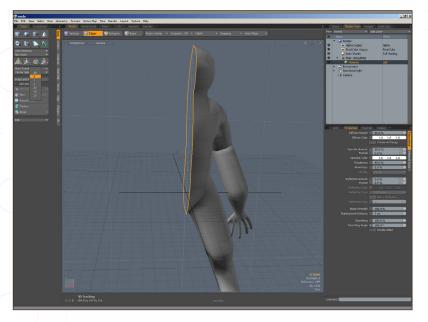
Fig 04

Because a silhouette is a shadow and lacks all forms of light, smoothing groups won't affect the appearance of the model's silhouette, which is just one more reason why it is so important to use silhouettes throughout the entire modelling process (Fig.03).

4. By using symmetry modelling, only one side of a model needs to be worked on, as a mirrored half will be automatically updated, greatly speeding up our workflow. In the perspective view, switch to front view, then to wireframe, and then select one half of the mesh and delete. Switch back to shaded view when ready (Fig.04).







**5.** Before we set up the mirror half it is important that the model centre line is exactly centred on the X axis. Switch back to perspective view, and in Edges mode double-click the open edge and use Center Selected > X in the Basic tab of the tools palette. This will align all the vertices to 0 along the X axis only (**Fig.05**).

**6.** In the Duplicate tab of the tools palette, select Mirror. Make sure the Axis is set to X and all values are set to zero, and then click the Apply Button. Finally, activate Symmetry for X in the top tool bar. As we mirror the mesh in the same layer, the vertices will be automatically joined to once again form a seamless mesh (**Fig.06a**).

Note: During mesh editing, it is sometimes possible for the mesh to become unsymmetrical even with Symmetry active. The common way to fix this would be to select the most favourable side and follow steps 3 to 6 again. However, a quicker method is to use the Symmetry tool in the top Geometry menu to re-align corresponding vertices. To use this tool, make sure Symmetry on X is active, and then click on the mesh. Any non-aligned vertices in negative X will be highlighted. By scrubbing, clicking and scrubbing the surface the Threshold value will be adjusted and will eventually start to re-align the corresponding vertices to each other. This tool will only work on vertices that have similar vertices on the mirrored side (Fig.06b).

7. It is important to eliminate any overlaps or intersections of polygons to assess the topology properly. The mesh will need to be relaxed in the shoulder, knees, elbows and groin areas where the overlapping occurs. To get an overall relaxed smoothing of the mesh, go to Tools > Deform > Smooth. By clicking Apply or in the viewport, most of the overlapping will be removed; however the shoulder underarm area will need additional adjustment to remove any overlaps (Fig.07).

Fig 06a

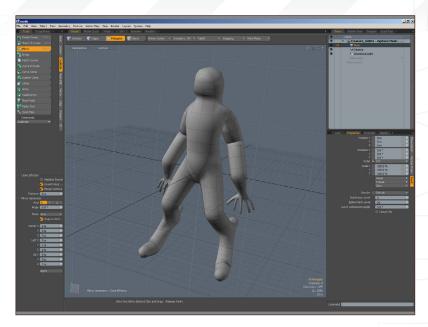
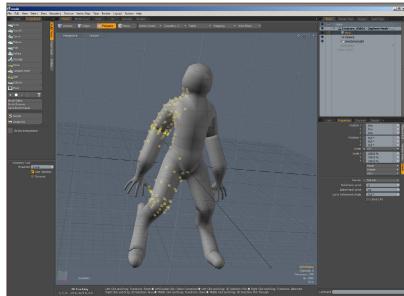
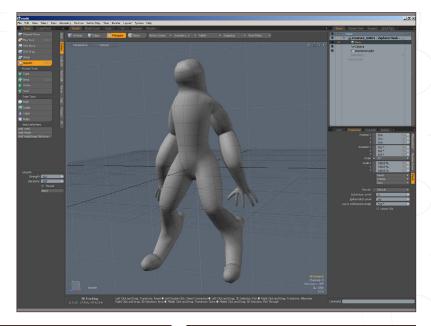


Fig 06b





# NEXT GEN CHARACTER CREATION SERIES Part1:

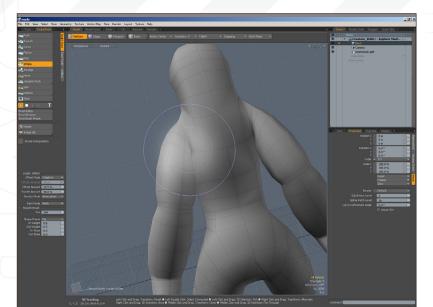


Fig 08

8. Switch to the Sculpt/Paint tab. modo's sculpt tools function very similar to the ones in ZBrush. Smoothing will be active when the Shift key is held down with all the tools. Select ether Inflate or Move tool, with the Smooth brush shape preset, and then click onto the shoulder area when holding the Shift. By using the Inflate and Move tools combined, with and without the shift key, the shoulder area can then be relaxed, smoothed out and cleaned up (Fig.08).

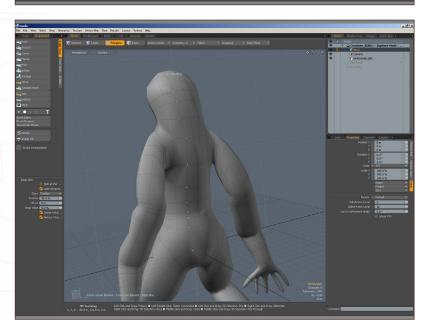


Fig 09

9. The broadness of the back dictates the need for more edges in that area. By using the Edge Slice tool (C key), add edges running from the lower back to the neck. This section of the model simply doesn't have enough detail to provide a clean and smooth silhouette (Fig.09).

**Note:** The Edge Slice tool can be found in the Basic as well as Mesh Edit section of the Tools palette; however, I prefer to use the hotkey C as it is one of the most commonly used tools. Experiment with the Snap value setting; the default is .5% but something closer to 5%-10% might be more helpful to start with.

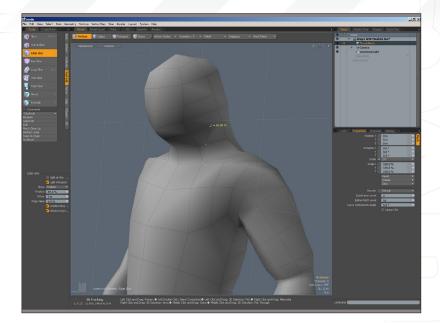
Residual Section Control Printer verbring the National Lancet Spring Residual Section Section

Fig 10

using the Element Move tool (T key) you can simply drag vertices, edges, or polygons around, one by one, without selecting and using a manipulator. Be aware that the elements will be dragged along the work plane dominant axis, so rotate the perspective to see your adjustments as well as to change the work plane's dominant axis. Much of the time, I prefer to move vertexes only, so changing the tools Element Falloff Mode from Auto to Vertex is helpful (Fig.10).

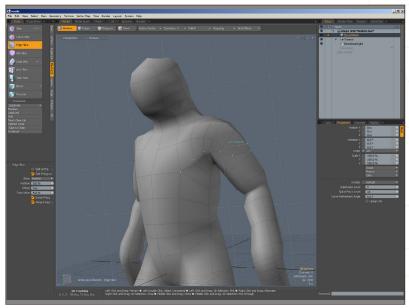
11. Add an edge in the neck to show the sternomastoid muscle. This will start off the flow of topology that is important in this area. Don't worry too much about keeping everything in quads (four-sided polygons), at this point just focus on getting good flow of the edges and then tidy up once that is in place (Fig.11).

Fig 11



**12**. Add an additional row of edges in to mark the underside of the chest. The edge loop also runs into the shoulder area to mark the insertion point of the main shoulder muscles. This gives great deformation when the character lifts up his arm (**Fig.12**).

Fig 12



13. Additional relaxing to the elbow and wrist sections will help towards improving the topology of the hand. The wrist will not animate well this way, and the fingers need a lot of work to get them to a good stage for sculpting and animation. The crotch area topology came out almost perfect, showing the power of ZSpheres (Fig.13).



# modo NEXT GEN CHARACTER CREATION SERIES Part1:

Fig 14

14. Sometimes it can be difficult to see the area you're working on when the rest of the mesh is in the way, so it is helpful to hide large portions of the mesh. Before working on the hands, select everything but the hand up to the elbow and go to the top menu View > Hide Selected (H key) (Fig.14).

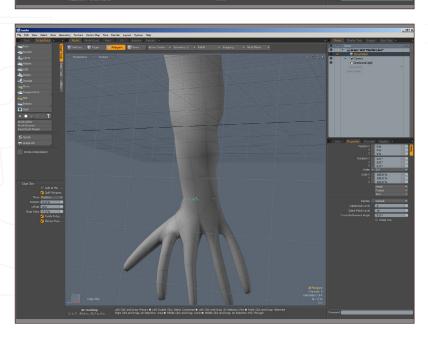


Fig 15

15. Add an edge here to define the wrist and the topside of the hand, and remove a few extra edges on the hand, such as on the fingers. When editing complex shapes it is helpful to have only the minimal amount of geometry until the overall form is complete, and then fill in to resolve the form (Fig.15).

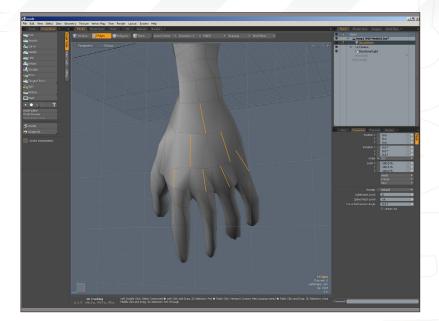


Fig 16

16. On the underside of the hand focus on re-flowing the topology to form the two major padded sections of the palm. It's important to note here the flow of the edges around the thumb, as this will later be very effective in pivoting the thumb around. All of this is done in the same manner as before, adding and removing edges to optimize the flow (Fig.16).

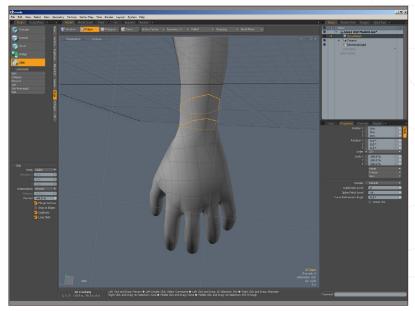
17. The top of the hand topology should flow out of the fingers and into the wrist, just as the bones and sinews do in your hands (Fig.17).

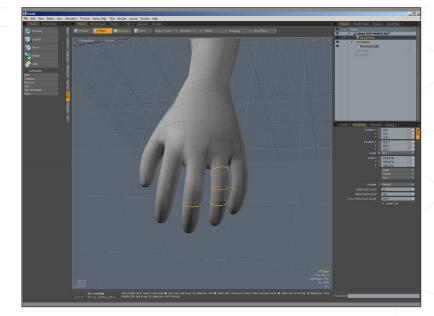
Fig 17



- 18. Another technique is to use the Edge Slide tool to move and duplicate edges. In Edge mode select the edge at the wrist, make sure Duplicate is active and add an additional edge. The aim of this is to end up with mostly or all quads, as the main issue is that triangles do not flex and animate very well, and can create a valence point on the surface. If triangles are needed, try to arrange the topology to keep triangles in areas that will flex very little. Hands can be notoriously difficult to model as they have a large range of motions. As people are so aware of the anatomy of hands, it becomes easy for observers to spot mistakes. It can be very helpful to have plenty of photo references of hands in both open positions and in various poses. A well made toy or action figure can also help for reference (Fig.18).
- 19. It is important that there is enough geometry where there might be a lot of detail, or in areas that might bend. In Edge mode, double-click the edge at the knuckles to select the full edge loop, and then use the Geometry > Bevel (B key) to double the edges in those areas (Fig.19).

Fig 18





# MEXT GEN CHARACTER CREATION SERIES Part1:

Final State State

go to View > Unhide (U key) in the top menu;
now the whole mesh is visible again. It is also
a good time now to make sure the model is still

symmetrical by using the Symmetry tool, as

outlined in step 6 (Fig.20).

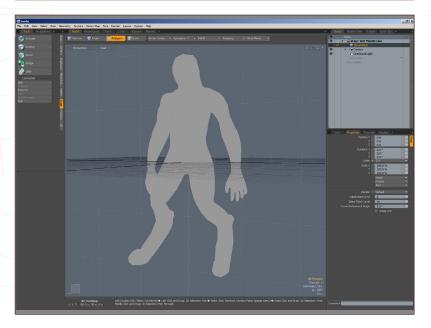


Fig 21

21. During the whole process of building the model, paying careful attention to the silhouette is important. The silhouette needs to look proportionally correct, interesting, and as close to the concept as possible. It can be helpful to see the model in pure outline without shading, so simply switch to Solid display from time to time (Fig.21).



Fig 22

22. The legs are going to need some attention before proceeding. Start by simplifying the connection between the bone sticking out and that second joint – it's more twisted than it should be for a simple base mesh. Also remove a number of edge loops in the bone section, and in the foot. It's important to remember that, just like for the hand, there should be enough geometry in areas where they might flex or bend (Fig.22).

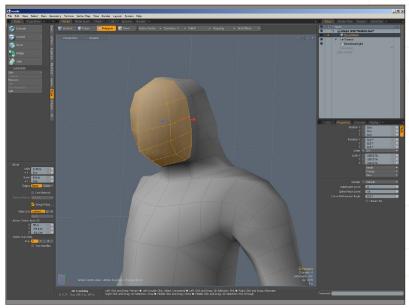
23. Flatten out the bottom of the foot and shape it so it resembles the concept art. It's important to note the foot is basically a hoof, and is solid. There are no toe areas, so the foot will not bend when walking. This means we can reduce the polygons on the topside of the foot by collapsing some edges and forming triangles in the corners (Fig.23).

Fig 23

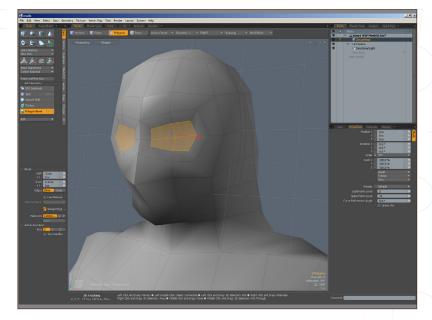


24. Moving onto the head, face detail will need to be blocked in now. Start by using Bevel (B Key) on the face to form edge loops around the head that range from the bridge of the nose to the bottom of the chin. Even if it's not perfectly tidy, it's important to block out all the basic topology loops in the face so that we can later alter the shape and quickly add detail by inserting new edge loops (Fig.24).

Fig 24



25. The first detail to block in is the eyes. If the eye holes are in the right place it makes it very easy to locate the nose, mouth, and ears. Creating circular loops around the eyes makes it easy to add additional loops later, but also creates the most optimal topology to animate the eyes (Fig.25).



# NEXT GEN CHARACTER CREATION SERIES Part1:

Fig 26

26. Like the eyes, the head needs more loops inside of the mouth section. Create circular loops around the mouth but selecting the central polygons and bevelling, making sure to position them at key points that will affect the silhouette. The top outer edge of the upper lip loop also forms the bottom edge of the lower lip. Additionally, make sure there are at least two edges in each corner of the mouth that will flow back towards the ear, so the mouth has enough edges to maintain its volume with deformation (Fig.26).

Fig 27

27. Select the newly created eye polygons and add another Bevel, then go to Polygon > Reduction Tool > Collapse. The selected polygons will now have been divided into triangles with a vertex in the middle. Also bevel polygons on the side of the head to form the ear. We want the topology on the top and side of the head to flow into the ear naturally, as any ugly topology connecting to the ear at harsh angles will appear darkly coloured due to the way realtime engines handle smoothing groups (Fig.27).

Fig 28

28. Add further loops to form the chin and jaw, making sure they follow the jaw line all the way up to the ears. As the nose does not really stick out of the character in the concept, we will not add topology for it. Rather, we will use the normal map from the high-poly sculpt alongside a good texture to achieve a realistic result. Not all detail needs to be in the base mesh, only detail that effects the silhouette (Fig.28).



29. Applying the same principles used throughout the tutorial so far, refine the neck area and shape the back of the skull. The large neck muscles should be prominent in the base mesh and follow the muscles' direction so the area will animate well when the character turns his head (Fig.29).

**30**. For the final section of this part, it is time to focus more on the overall volume and silhouette to match the concept. Start by using the Sculpt, Move, and Inflate tools with Shift-Smooth to quickly adjust the mesh, and then edit edges and vertices as needed by using the Element Move, Edge Slice and Edge Slide tools.

One final and very powerful tool is found in the Deform tab in the Tools palette. The Flex Tool will allow you to apply transformations that have the centre aligned to the selection boundary with an adjustable fall-off. This tool functions very similarly to the Transpose tool in ZBrush, allowing for quick posing and mesh adjustments. What we have at the end is a base mesh that will not only work well for sculpting our high-poly model, but also to animate well, run efficiently in our real-time engine, and look good from all distances due to our care and attention to the silhouette (Fig.30).

Next month we'll be sculpting the high-res model in ZBrush, and I'll be back in Part 4 of this series for more mode work.

# Creature Concept by RICHARD TILBURY

Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by John Hayes for modo

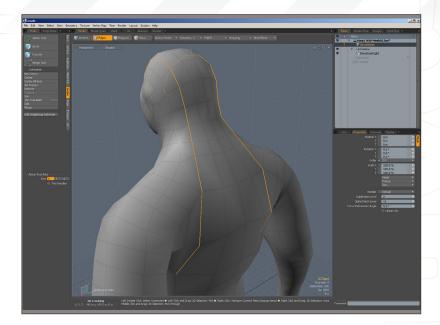
Tutorial by:

### John Hayes

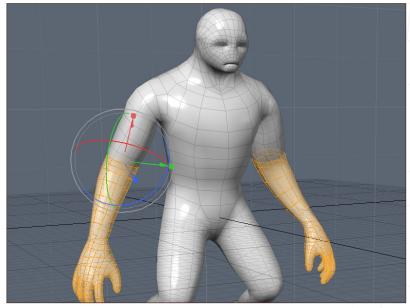
For more from this artist visit: http://zugok.cgsociety.org/ Or contact them:

zugok@sbcglobal.net

Fig 29









#### **MODO 401**

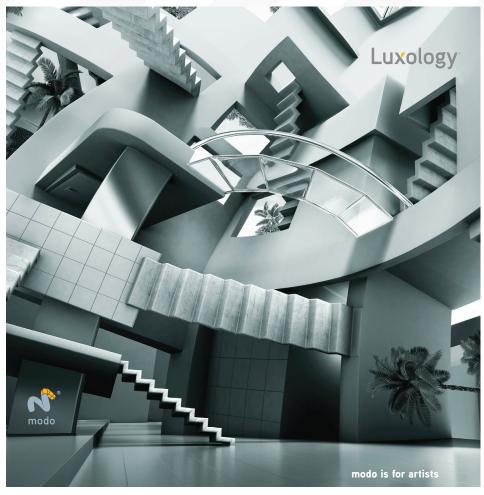
modo 401 from Luxology, which shipped in June 2009, is the fourth major release of this modern 3D modelling, animation and rendering software for the Mac and PC. Luxology has been adding features to modo at a rapid clip, making modo 401 an end-to-end solution that encompasses modelling, sculpting, painting, animation and rendering in an artist-friendly user interface. The modo community (http://www.luxology.com/community/) is one of the most active 3D communities on the Web and is populated by 3D artists and hobbyists working in design visualisation, package design, game development, film visual effects, video production and graphic arts.

Rendering and animation improvements head up the list of what amounts to an across-theboard improvement to modo's functionality. There are also major workflow enhancements such as built-in support for asset re-utilisation. This makes it easy to save and reuse a variety of pre-built content (Presets) throughout the creation process, speeding operations such as modelling and texturing for both experts and novices alike. Over 1,500 Presets are included within modo 401, and the company has dedicated a section of its website to allow modo 401 users to easily share Presets with one another. A new drag-and-drop interface for Presets allows artists to construct models, decorate objects and assemble entire scenes inside modo 401 in a matter of minutes.

#### WHAT'S NEW!

modo 401 features a wide array of productivity enhancing features, including:

Rendering enhancements: The new modo
401 preview renderer includes lighting
enhancements such as caustics, dispersion,
blurry refraction, volumetric lighting and
support for Pixar-patented deep shadows.
The renderer supports stereoscopic output
and runs on up to 32 cores



- Animation improvements: modo 401 now supports the development of complex mechanical assemblies that can be driven by a simple set of controls
- Expanded modelling toolset: Edge details such as crown moulding or complex bevels are now easy to create via new Profile Presets that are picked from a thumbnail browser while modelling. modo 401 also includes new workflows for re-building curves and creating new surfaces on top of complex CAD data or scanned datasets. New replica modelling tools allow dense amounts of surface details like welds, rivets and barnacles to be added with minimal impact on scene size
- Faster scene preview: Huge speed improvements allow for quicker preview renderer updates to changes made when modelling, texturing or lighting a scene

- More realistic materials: The new Fur material allows a wide array of material appearances from hair, bristles and fur, to water droplets, string, grass and tinsel
- Data import and export: modo 401 is now even better equipped to read and write data that can be exchanged with other 2D and 3D applications. File sharing improvements include COLLADA, FBX, 3DM and a new SolidWorks 2009 file importer for Windows
- High-end processing options: For the first time, modo 401 is available for 64-bit Windows

For more information please visit: http://www.luxology.com
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